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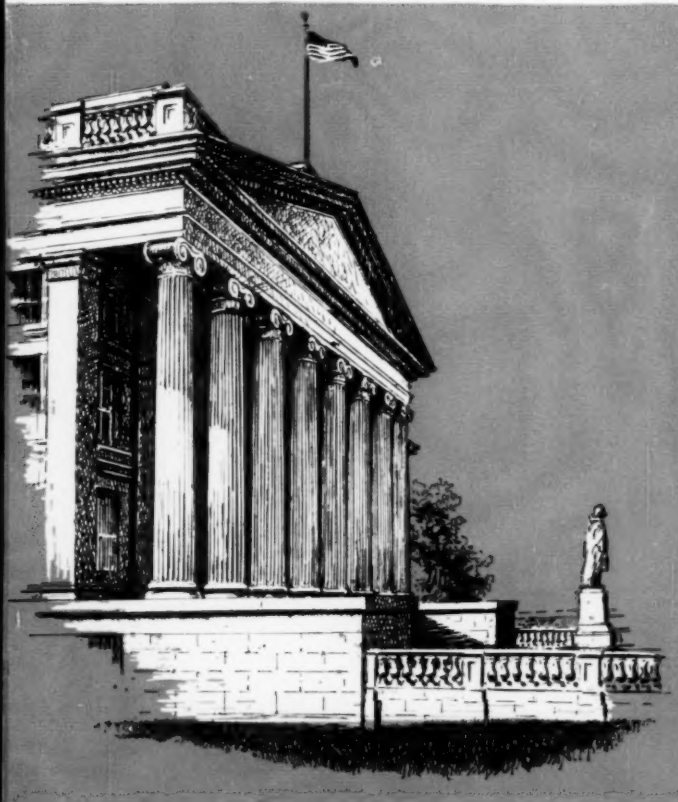

Articles on

- Should Gold be Scrapped?
- Financing of Captive Finance Companies
- Bank Trust Investments in 1964
- The Strategy of Advance Refunding
- Scale Economies and Marginal Costs in Banking
- External Effects of Monetary Policy

- Comment and Rejoinder
- Legal and Regulatory Developments
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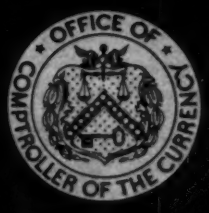

THE COMPTROLLER OF THE CURRENCY • UNITED STATES TREASURY

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The NATIONAL BANKING REVIEW

A JOURNAL OF POLICY AND PRACTICE

VOLUME 2, NUMBER 4, JUNE 1965

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► HARRY G. JOHNSON

Should Gold Be Scrapped?

The problem of gold and its international monetary role has once more become an active issue. President de Gaulle recently re-opened the controversy with his attack on the special status of the pound and the dollar in the present international monetary system, and his invitation to join France in a return to the gold standard. Of more immediate significance, his Minister of Finance, M. Giscard d'Estaing, announced a new policy of taking settlement of French balance-of-payments surpluses only in gold. In this country, the Congress has approved a proposal to increase the supply of "free" gold by eliminating the 25 percent cover requirement against Federal Reserve deposits, and the President has introduced a series of new measures aimed primarily at cutting the volume of U. S. private foreign investment. The President's balance-of-payments message to Congress went further than any previous official statement in endorsing the view that the present international monetary system needs to be revised and, specifically, in advocating the development of supplementary sources of reserves to relieve the strains which now result from the use of the dollar and sterling as substitutes for gold.

These recent official pronouncements and policy changes have merely brought into the open a conflict that has been building up over several years—ever since it became evident that the U. S. balance-of-payments deficit was not a transitory phenomenon, but a chronic and deep-seated malaise that would take many years to remedy through the natural processes of international economic adjustment.[1] That conflict centers on the fact that the present international monetary system, in which the dollar

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[1] See Walter S. Salant *et al.*, *The United States Balance of Payments in 1968*, The Brookings Institution, Washington, D. C., 1963.

plays a key role as an international reserve-asset alternative to gold, has enabled the United States to finance its sustained deficit by relying on the willingness of foreigners to hold dollars, and increasingly on the recognition by foreign monetary authorities that they must hold dollars if they are not to precipitate a collapse of the system. At the same time, the fact that foreign monetary authorities could precipitate a collapse of the system has enabled them to exercise pressure on the U. S. to pursue policies designed to mitigate the deficit and accelerate its solution.

Essentially, the conflict derives from the system of fixed exchange-rates itself, which requires that a deficit-surplus situation be remedied by some combination of deflation in the deficit country (the U. S.) and inflation in the surplus countries (Western Europe). It has arisen because the United States has taken the position that its contribution to the adjustment should not entail a sacrifice of domestic employment, but only the prevention of increases in the domestic price level. Inflation in Europe is to be relied upon to restore adequate U. S. competitiveness in world markets. The Europeans, on the other hand, who have already endured a substantial inflation without a noticeable trend toward improvement in the U. S. balance-of-payments, and who for historical reasons intensely dislike inflation, feel that too much of the burden of adjustment is being thrust upon their shoulders, and that the United States should do a great deal more than it has. In effect, the adjustment processes required under a fixed-exchange rate system are being blocked by the refusal of each side to tolerate the policies appropriate under the logic of the system. This conflict is exasperated by the failure of each side to respect the political considerations which inhibit the adoption of policies necessary to maintain a fixed-exchange-rate system.

The conflict has been further sharpened in the past two years or so by the fact that the continuation of the U.S. deficit has been associated with a substantial increase in private capital outflows from the U. S. to Europe. I say "associated with" although many observers, especially in Europe, would say that these deficits are "caused by" the private capital outflow. Because the items in the balance of payments are economically interrelated and not simply additive, one cannot assume that an increase in the deficit can be attributed to a contemporaneous increase in any one category of payments. Instead, the increased capital outflow should be related to the continued over-valuation of the dollar relative to the European currencies, as well as to the attractive effects of the Common Market tariff. In any event, many Europeans believe that by financing the U. S. deficit they are indirectly financing U. S. private investment in Europe, which they resent. And, they cannot understand the reluctance of the U. S. authorities either to raise interest rates (which the U. S. authorities fear would create unemployment) or to impose controls on international capital movements (which the U. S. has been increasingly forced to adopt even though it goes against deep-rooted principles of free enterprise).

Since the adjustment of the balance-of-payments disequilibrium between the United States and Europe would entail the frustration of vital national policy objectives, the process is bound to be prolonged as well as politically acrimonious. This fact has major implications for the present international monetary system which few have appreciated. With long lags in the adjustment process, the international borrowing and lending required to finance the disequilibria entail international official capital movements larger in quantity and longer in duration than can be accommodated by the traditional type of reserve movements between central banks. Although the present system requires long-term international loans of the type provided under

the Marshall Plan to meet the dollar-shortage problem, the monetary authorities of the leading countries have instead been elaborating the technique of short-term international credits. This technique is well adapted to overcoming speculative short-term capital movements, but is inadequate to deal with chronic balance-of-payments disequilibria.[2]

The same point can be made in a different way. If prolonged disequilibria are to be prevented, it is necessary to devise a monetary system that will force either the deficit countries, or the surplus countries, or both, to adopt policies that will promote prompt adjustment despite their other policy objectives. The Europeans believe that the present system, in which the pound and the dollar serve as reserve currencies, enables the U.K. and the U.S. to evade the necessity of prompt adjustment; and they desire revisions of the international monetary system that will reduce or remove this possibility of evasion. General de Gaulle's recent attack on sterling and the dollar may be interpreted as an expression of that view. A return to the gold standard, which he advocated, would impose ineluctable pressures for prompt adjustment on deficit and surplus countries alike.

General de Gaulle's advocacy of a return to the gold standard has been derided as "a return to the system that broke down in 1931." But, it should be understood that the system that broke down in 1931 was not a gold standard of the classical type, but a gold-exchange standard precisely like the present international monetary standard. It broke down precisely because a few national currencies were being used on a large scale as substitutes for gold that did not exist. A return to a true gold standard, if it could be effected, would eliminate this grave deficiency in the present international monetary system, since all reserves would be hard metal and not credit-money whose use in place of gold depended on confidence. Nor is it a valid argument against a return to the gold standard that, in order to avoid a sharp deflation, the price of gold would have to be doubled or tripled, thus creating undesirable capital gains for holders and producers of gold. A change that would promote the general good cannot properly be opposed on the ground that some people will derive a windfall profit from it.

The real arguments against a return to the gold standard derive from that very characteristic of gold which, in the eyes of its proponents, gives the gold standard its virtue—the fact that the production of gold entails a real cost. This fact has two crucial implications. First, there will always be an incentive for the financial system to develop credit substitutes for gold because, on the one hand, gold yields no interest to the holder whereas credit substitutes do and, on the other hand, credit substitutes can be produced (though not maintained as efficient substitutes) at virtually zero real cost. In fact, the history of money is essentially a history of the gradual substitution of credit-money for commodity-money in response to the interaction of scarcity of the latter and ingenuity in devising the former.[3] The economics involved ensure that a return to the gold standard would be a practical impossibility. Second, tying the international monetary system to a produced commodity, especially a mineral, as the basic money inevitably entails

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[2] For a suggestion along these lines, see Harry G. Johnson, "Major Issues in Monetary and Fiscal Policies," *Federal Reserve Bulletin*, 50, no. 11, November 1964, pp. 1400-1413, especially p. 1402.

[3] On this point, see R. Triffin, *The Evolution of the International Monetary System: Historical Reappraisal and Future Perspectives*, Princeton Studies in International Finance, No. 12, Princeton, 1964.

exposing the system to erratic changes in the stock of money resulting from the vagaries of technical change and new discoveries in the industry producing the monetary commodity. Rationality suggests that these erratic changes can and should be avoided by deliberate monetary management, and that the costs of production incurred in gold mining can be escaped by resorting to credit-money. A return to the gold standard would therefore involve a deliberate surrender of the chance to exercise rationality in monetary affairs in favor of control by erratic and unpredictable forces. It thus seems clear that the gold standard cannot be restored; fundamental forces both of economics (the principle of cost-minimization through substitution) and of social psychology (the desire to control and improve the environment) are against it.

The present gold-exchange standard, nevertheless, contains inherent and dangerous weaknesses which increasingly call for reform of the system.[4] These weaknesses all stem from the fact that, while gold is the ultimate or basic form of international reserve, it is not the only form. Since, as I have argued, it is not possible to increase the role of gold to replace this mixed system by an approximation of the gold standard, reform must move in the direction of decreasing and altering the role of gold so as to minimize the dangers that its presence imposes on the system. The logical end of this process is the eventual scrapping of gold as an international money, and its replacement by some international monetary system based entirely on credit.

International monetary experts who have studied the contemporary international monetary system are agreed that the system poses three serious problems.[5] One is the *long-run liquidity problem.* Under the present system, the growth of international reserves required to sustain the growth of world trade and payments depends on the vagaries of new gold production, private hoarding and Russian dishoarding of gold, and the balance-of-payments experience of the reserve currency countries. Further, if new gold supplies are inadequate, the required reserves must be supplied by continuous deficits of the reserve-currency countries. This undermines their reserve positions and the confidence on which the use of these currencies as substitutes for gold depends. A second problem is the more general one of *confidence.* Loss of confidence in one reserve currency leads to conversions into other currencies. This disturbs international monetary relationships and may prompt central banks to convert currencies into gold, which could produce an international liquidity crisis (as happened in 1931). The third is the *adjustment problem,* the lack of a clear-cut mechanism of adjustment. This lack is the result of the ability of reserve-currency countries to finance deficits by running up currency debts to others, and the ability of other countries to neutralize reserve changes. All three problems are associated with the use of national currencies as substitutes for gold, where the currencies can be converted into gold at the option or whim of the central bank holding them.

It is evident that a solution of the long-run liquidity problem requires governing the growth of whatever credit money is used as a substitute for gold in a manner that will assure an increase in the total of this money-plus-gold equal to the required growth of international reserves. A solution of the confidence problem re-

[4] On the weaknesses of the present system, see especially R. Triffin, *Gold and the Dollar Crisis,* New Haven: Yale University Press, 1960.

[5] Fritz Machlup and Burton G. Malkiel (eds.), *International Monetary Arrangements: The Problem of Choice,* report on the deliberations of an international study group of 32 economists, Princeton, N. J.: Princeton University Press, 1964.

quires restricting the convertibility of currencies into one another, and into gold, by central banks. One possible solution to both problems, towards which the central bankers have been pushed unwillingly by the prolonged dollar deficit, would be to agree to a suspension of dollar conversion into gold and to trust the U. S. authorities to provide an appropriate growth of reserves by their balance-of-payments policies. Such a proposal for a dollar standard, however, would not be politically acceptable to other countries—and, given the recent U. S. balance-of-payments history, not commendable as a solution to the long-run liquidity problem. To be generally acceptable, a solution must replace the dominance of the dollar by some more-international form of credit-money arrangement, and one subject to more effective international control.

Two major alternatives have been put forward. One is the Triffin Plan, which calls for centralization of reserves in an expanded International Monetary Fund. Under this plan, countries would hold their reserves in gold and Fund deposits in some fixed ratio. The Fund would hold national-currency assets to back its deposit liabilities, and would increase international reserves, over time, by open market operations.[6] The other is the Bernstein Plan, or currency-reserve-unit plan, which calls for the construction of bundles of the leading national currencies, with fixed proportions between the amounts of the various currencies in the bundle (the currency-reserve unit). Under this plan, countries would be obliged to hold these bundles within a certain range of ratios to their holdings of gold; the total number of currency-reserve units outstanding and the required ratios of units-to-gold would be raised by international agreement, over time.[7] The Triffin Plan, in short, would substitute a genuinely international credit money for national currencies in international reserves, and subject the quantity outstanding to control by an international institution. The Bernstein plan would substitute a composite bundle of national currencies for the pound and the dollar, and have the quantity-outstanding controlled by agreement among the major-currency countries.[8]

Both schemes would reduce and stablize the role of gold in the international monetary sysem. Equally, both would reduce—and the Triffin Plan would virtually eliminate—the reserve-currency role of the dollar and the pound. The major difference between these plans, apart from the more radical nature of the Triffin Plan, lies in the provision made for control of the quantity of international reserve money. This difference derives its main significance from the conflict concerning the adjustment mechanism which I have already discussed. In the International Monetary Fund, the Europeans have minority voting power and the United States has great influence; in a currency-reserve-unit scheme, the Europeans would have a majority vote if not a veto power. The Europeans would obviously prefer to have this power, given their views on the inflationary character of the present system. Consequently, the currency-reserve-unit scheme is almost inevitably the one that will emerge from current deliberations on the reform of the system. Moreover, for this same reason, the currency-reserve-unit scheme is likely to constitute more of a return to

[6] The main outlines of the Triffin Plan are presented in R. Triffin, *op. cit.*; Professor Triffin has, however, modified the details of his plan in numerous subsequent writings.

[7] The Bernstein Plan, originated by Dr. Edward M. Bernstein, former Research Director of the International Monetary Fund, has been privately circulated in various versions but not published in any easily accessible source.

[8] For a compendium of the many plans for international monetary reform advanced in recent years, see Herbert G. Grubel (ed.), *World Monetary Reform: Plans and Issues*, Stanford: Stanford University Press, 1963.

something like the discipline of the traditional gold standard than would the Triffin Plan. The mechanism of adjustment, however, would be vastly different, since indications are that it would include a variety of controls on international trade and capital movements.

In any case, it is clear that the next stage in the evolution of the international monetary system must involve a whittling down of the international monetary role of gold (as well as of the U. S. dollar). The real division between the Americans and the Europeans is no longer over that issue—the American position on it changed abruptly in mid-1963—but over the distribution of the responsibility for adjustment of international disequilibria.[9] Logically, the whittling down of the role of gold and the establishment of a completely credit-international-money would most likely entail the elevation of the International Monetary Fund into an independent world central bank. However, given the political jealousies between Europe and the United States and European suspicion of the I. M. F. as a creature of the United States, that event appears to be a long way off.

There is, however, some possibility that the demotion of gold from its monetary role could occur much more rapidly, and by a completely different sequence of events. The international monetary strains of the dollar-surplus epoch, as already mentioned, have been the consequence of an attempt to maintain a system of fixed exchange rates without either the deficit or the surplus countries being willing to pursue the required adjustment-policies to the necessary extent. It is possible that, disenchanted with the attitudes of countries it assisted generously in the postwar reconstruction period, the U. S. will simply terminate the convertibility of dollars into gold (or of gold into dollars). In that event, gold would not be scrapped, but would become, at best, a commodity especially suitable for the conduct of intervention-operations in foreign exchange markets. Indeed, judging by the 1930's experience of floating exchange rates, the demand for gold could conceivably increase. This, however, would be a small price to pay for the establishment of a more rational international monetary system than we now have.[10]

[9] *Ministerial Statement* of the Group of Ten and *Annex* Prepared by Deputies, reprinted in *Federal Reserve Bulletin*, 50, no. 8, August 1964, pp. 975-999; see also *International Monetary Fund, 1964 Annual Report*, Part II, Washington, D. C., 1964.

[10] On the case for a devaluation of the dollar, see Harry G. Johnson, "The Overvaluation of the Dollar," Chapter 20 in *The Canadian Quandary*, Toronto: McGraw-Hill of Canada, 1963.

On the advantages of floating exchange rates, see Milton Friedman, "The Case for Flexible Exchange Rates," in *Essays in Positive Economics*, Chicago: University of Chicago Press, 1953; and Egon Sohmen, *Flexible Exchange Rates*, Chicago: University of Chicago Press, 1960.

►VICTOR L. ANDREWS

Interest Rates, Liquidity, and the Financing of Captive Finance Companies

I. *Introduction*

Borrowing by the credit subsidiaries of nonfinancial corporations has mounted to impressive yearly rates, and by the end of 1963 had resulted in $4.4 billions of debt outstanding.[1] An overwhelming part of this debt issuance came in the last decade. Company policies with respect to liquidity-maintenance and cost-minimization, together with relative interest rates, have determined the pattern of the subsidiaries' demand for financing.

This article reports a study of the financing of the credit captives. It argues that the captives have fashioned the term structure of their outstanding debt so as to assure liquidity rather than take the gamble on the term structure of interest rates necessary for cost minimization. Within short-term financing, however, the captives have exploited interest rate differentials aggressively, constrained principally by supply conditions in the open money market and by costs of market access.

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The Division of Research at the Graduate School of Business Administration, Harvard University, generously supported much of the work of this article under a grant from the Ford Foundation.

[1] Because of the distortions which would be introduced by its great size relative to the rest of the industry, all of the data and and discussion in this article exclude General Motors Acceptance Corporation.

Table 1
Assets of a Sample of Captive Finance Companies, Excluding GMAC, 1955-1963
(Assets in Thousands of Dollars)

Year	Number of Companies Included	Cash and Securities	Wholesale Notes Receivable	Retail Notes Receivable	Miscellaneous Assets	Total Assets
1955	33	$ 78,444	$ 270,676	$ 715,598	$ 52,495	$1,117,213
1956	39	115,581	356,316	1,011,337	72,017	1,555,251
1957	48	148,262	496,057	1,312,095	91,921	2,048,335
1958	53	172,903	597,685	1,606,188	93,677	2,470,453
1959	53	189,460	801,747	2,065,068	114,726	3,171,001
1960	56	239,558	716,752	2,949,861	80,474	3,986,645
1961	63	301,123	755,501	3,560,377	92,428	4,709,429
1962	62	305,316	895,406	3,882,204	106,178	5,189,104
1963	60	282,423	1,017,039	4,262,492	191,137	5,759,690

II. *Aggregate Demand of the Captives for Funds*

The size of the credit captives' demands for financing is a result of their growth in numbers and of individual company assets.

A. Growth of Numbers and Assets

An earlier article[2] reported the identification, by industry classification and birth date, of 102 finance subsidiaries which operated actively for at least some time in the post-World War II period through 1960. Subsequent work turned up others, and with them new company originations during 1961-1963 combined to raise this total to 132. Births were heaviest during both periods in the same industrial classifications–the manufacture of electrical and nonelectrical machinery and transportation equipment, and retail trade.

Table 1 is a breakdown of the assets held by a progressively enlarged sample of finance subsidiaries for the period 1955-1963. Net growth of aggregate assets exceeded $4.6 billion. About $3.5 billion flowed into net credit extension through retail notes receivable, i.e., deferred payment sales contracts representing a mixture of consumer and business financing (mostly the latter). Net expansion of lending on inventory-secured (wholesale) notes receivable absorbed approximately $.75 billion.

With negligible exceptions, captive company assets are not included in tabulations of the FTC-SEC *Quarterly Financial Report for Manufacturing Corporations.* A comparison indicates that in 1963, receivables held by this sample of captives within their respective industries were equal to 22.5 percent of receivables aggregated by the *Quarterly Report* in nonelectrical machinery, 37 percent of those in electrical machinery, and 33 per-

[2] Victor L. Andrews, "Captive Finance Companies: Their Growth and Some Speculations on Their Significance," *Industrial Management Review*, II, Fall 1961, p. 31. Reference to this article should be made for points of detail, definitions, and an extensive description of sources of data and methods used. The definition of captives employed there and throughout this paper is: (a) financial subsidiaries of nonfinancial parent corporations dealing in greater than local markets with (b) assets composed predominantly of notes receivable. Virtually all of the subsidiaries of so-called shell home companies were excluded.

Table 2

Debt Issuance by a Sample of Captive Finance Companies, Excluding GMAC, 1947-1963

(Dollars in Millions)

Year	No. of Cos.	Net Change in Short-Term Borrowing			New Issues and Retirements of External † Long-Term Debt				Total Net Flotations ‡	Net Change Short-and Long-Term
					Senior		Subordinated			
		Bank Loans *	Comm'l Paper	Total	New Issues	Retirements	New Issues	Retirements		
1963	60	$160.9	$227.3	$388.3	$111.3	$18.4	$59.5	$3.0	$149.3	$537.6
1962	62	−309.5	645.3	335.8	113.3	38.1	78.8	1.9	152.0	487.8
1961	63	−28.0	185.3	157.3	349.9	10.0	71.0	8.5	402.4	559.7
1960	56	175.7	206.4	382.1	164.5	24.2	35.1	1.0	174.4	556.5
1959	53	88.6	166.7	255.3	109.4	30.2	11.5	9.8	80.9	336.2
1958	53	57.3	63.4	120.7	54.2	45.7	13.0	4.1	17.4	138.1
1957	48	283.7	25.4	309.1	159.4	11.2	33.0	3.0	178.2	487.3
1956	39	121.5	73.6	195.1	104.3	—	28.0	—	132.3	327.4
1955	33	85.4	70.3	155.7	43.8	8.5	20.0	2.0	53.3	209.0
1954	25	−41.5	12.7	−28.8	41.1	2.5	8.0	—	46.6	17.8
1953	19	175.0	49.1	224.1	.9	2.5	—	—	−1.6	222.5
1952	16	87.9	64.2	152.1	.7	2.5	—	—	−1.8	150.3
1951	15	23.0	28.2	51.2	26.3	2.5	—	—	23.8	75.0
1950	14	52.1	22.7	74.8	24.0	—	—	—	24.0	98.8
1949	14	51.2	2.7	53.9	14.0	—	2.0	—	16.0	69.9
1948	12	14.1	22.8	36.9	46.0	—	3.0	—	49.0	85.9
1947	9	10.2	19.4	29.6	—	—	—	—	—	29.6
Total	..	1,007.6	1,885.5	2,893.1	1,363.1	196.3	362.9	33.3	1,496.2	4,389.4

*Includes some borrowing from an independent finance company by one captive in the years 1957-1961.
†Debt issuance by the captive to lenders other than the parent company.
‡Net flotation figures shown here will not necessarily check with yearly balance sheet differences shown elsewhere in connection with this research. Flotation figures here are on a calendar year basis; elsewhere, they have been and will be shown in tabulations made from fiscal year closing dates for individual companies. Also, balance sheet tabulations are subject to some error in the classification of current maturities of long-term debt.

cent of those in transportation equipment.[3]

B. Demands for Funds by the Captives

Issuance of debt, by year, for a continually enlarging group of captive finance companies[4] is shown in Table 2 for the post-World War II period through 1963. Over the years 1947-1963, this sample of captives borrowed in excess of $4.4 billion net, most of it between 1955 and 1963. The increase in bank debt outstanding equaled $1 billion, and the net growth of commercial paper outstanding was more than $1.9 billion. Gross long-term borrowing was about $1.7 billion, higher than net long-term flotations by the $.2 billion of retirements. About $3.70 gross of senior long-term debt was floated for each $1 gross of subordinated issues.

III. *Financial patterns*

Discussions of the financial structures of independent finance companies often include distinctions by size of company.[5]

[3] Figures for earlier years are reported in Andrews, *op. cit.*

[4] For 1955-1963, the sample is the same as that covered by Table 1.

[5] Many examples could be cited; a few will suffice. See *Consumer Installment Credit*, Board of Governors of the Federal Reserve System, Part I, Vol. II and Part II, Vol. I, Washington,

Table 3 follows this lead in breaking down liabilities of the captives covered in the sample of Table 1 above, and indicates the number of companies tabulated in each of the size groupings.[6] Table 4 presents the same items as percentages of total liabilities.

The liabilities breakdowns show rough similarity in the proportional division of long- and short-term sources across size classes. This similarity is evident for 1963, for example, when negotiated short-term debt (bank loans plus commercial paper outstanding) comprised 45, 49, 50, 39, and 56 percent of total assets for the size groups from smallest to largest, respectively. Approximate uniformity between size classes holds at slightly different levels for other years. The long-short division of total financing was least stable for the aggregate of captives in the under $10 million asset category.

Parent company financing of an individual captive consists of the sum of equity, loss reserves, and loans.[7] Over the period shown, the average value of parent financing for captives under $10 million is clearly higher than the corresponding average for the others. There is a suggestion in the same figures for other size classes that the total of parent company financing is inversely related to size of captive, but the relationship is irregular. However, the sum of equity and parent-supplied subordinated debt (most of the risk-bearing base) *is* inversely related to size,[8] as the next section shows.

A. The Debt/Equity Division of the Captives' Financing

Time after time it has been stated to the author, by both lenders and management of parents and captives, that heavy usage of debt financing has been the captives' prime *raison d'être*.

In contrast with the fractional debt/equity ratios typical of their nonfinancial parents, the captives can boast debt several times the size of their equity, or several times the size of their equity plus subordinated debt. This is readily observed in Tables 3 and 4. These multiple ratios are made feasible by the low "risk" in cash flows from the captives' receivables.[9] Low variance in cash flows, of

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D.C.: U.S.G.P.O., 1957; *Monograph on the Consumer Finance Industry for the Commission on Money and Credit*, National Consumer Finance Association, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1962; and Francis R. Pawley, "Survey of Finance Companies, Mid-1960," *Federal Reserve Bulletin*, 47, October 1961, pp. 1140-1160.

[6] The number of companies within each size bracket varies from year to year as the total number tabulated grows and as individual companies move between size classes. Except by coincidence, the composition of each size class is not constant from year to year.

[7] Parent loans are polyglot. Advances are nominally short-term, but are difficult to distinguish from accruals on many balance sheets. Some parent commitments are clearly long-term, especially subordinated indebtedness which serves as part of the foundation for senior debt. But this facet of short-term loans is not as easily distinguished. Some of the latter are noted on balance sheets as demand notes. Many times no such notation is made, but swift year-to-year fluctuation gives it the telltale mark of serving as a demand note in purpose, if not in name. Furthermore, some short-term debt to parent companies is subordinated.

[8] The rapidity of growth of individual companies made it impossible to provide a sample with constant identities within size classes which retained respectable numbers for a significant period. However, for the period 1957-1961, a constant identity sample of 31 companies was selected, and its balance sheets tabulated by years in the same size classes used in Tables 3 and 4. This presumably eliminated the effects of shifting company composition. Generalities made above regarding the similarities of short- and long-term financing and parent financing across size classes hold also for the constant company sample.

[9] A clean liability break between parent and captive usually exists. In most instances, receivables are sold by the parent to the captive without recourse or with only limited recourse. Parent companies seldom guarantee the debt of their captives. Thus, the subsidiaries' creditors have rather clear protection from the solidity of the receivables once the transfer is a fact.

Table 3

Liabilities of a Sample of Captive Finance Companies, Excluding GMAC, by Size of Company, 1955-1963

(Dollars in Millions)

Asset Size Group by Year		No. of Cos.	Negotiated Short-term Borrowing		Accruals	External Long-Term Debt		Borrowing from Parent			Loss Reserves	Equity
								Advcs. and Accruals	Long-Term Debt			
Size	Year		Bank Loans *	Comm'l Paper		Senior	Subdt.		Senior	Subdt.		
	1963	11	$20.8	$1.7	$1.9	$2.5	$1.3	$1.7	$1.6	$3.8	$.7	$13.6
	1962	10	27.4	2.8	2.3	1.0	1.3	1.1	1.7	3.0	.5	8.7
	1961	15	41.3	—	1.6	6.0	1.0	4.4	—	6.6	.5	15.3
	1960	20	39.1	—	4.5	—	—	8.5	—	2.5	.4	17.2
Under $10	1959	22	22.8	—	2.6	4.7	—	5.1	—	2.2	.8	19.5
	1958	25	32.2	—	4.6	4.8	—	9.5	—	3.3	.9	17.9
	1957	26	31.7	—	4.3	11.7	—	9.0	—	4.3	1.2	14.5
	1956	24	20.8	—	4.5	17.9	—	17.2	—	.2	.5	17.5
	1955	24	23.8	—	4.2	10.0	—	19.4	—	9.1	.5	23.2
	1963	17	110.0	31.9	10.3	34.8	4.6	18.0	—	19.8	3.3	72.3
	1962	23	167.4	31.0	10.6	49.7	10.6	12.1	—	25.9	4.9	81.5
	1961	15	106.7	24.0	3.1	26.5	—	9.7	—	14.3	2.2	37.8
	1960	11	67.8	8.7	3.1	47.6	—	5.7	—	13.4	3.0	22.9
$10-$25	1959	10	56.3	3.6	4.6	39.8	—	4.4	—	9.0	1.6	20.8
	1958	10	75.6	2.1	2.6	29.0	—	4.6	—	9.8	.3	19.3
	1957	6	50.0	—	2.2	12.6	—	.8	—	17.0	—	16.2
	1956	6	35.9	2.2	3.8	—	—	17.4	—	13.5	.2	23.4
	1955	2	16.7	—	.1	—	—	4.4	—	—	.3	10.7
	1963	15	240.0	115.6	12.5	162.8	26.6	34.5	6.3	12.4	8.1	93.6
	1962	15	239.9	143.3	15.3	197.3	36.6	62.9	3.0	17.6	9.4	126.7
	1961	19	317.8	66.4	20.5	160.3	28.1	123.6	—	47.5	16.0	128.5
	1960	14	404.8	39.1	19.3	29.5	20.6	70.1	—	46.3	12.6	158.3
$25-$100	1959	12	403.8	16.7	13.9	40.7	4.0	49.7	—	52.3	7.7	82.3
	1958	12	391.3	21.6	29.0	37.9	16.0	72.1	—	54.5	7.4	77.2
	1957	11	323.9	5.8	15.8	26.8	12.0	5.8	—	57.5	5.7	40.0
	1956	5	132.1	—	8.4	26.1	12.0	26.6	—	15.9	4.1	7.5
	1955	3	72.0	—	6.6	23.8	6.0	2.1	—	—	2.1	10.0
	1963	11	364.0	259.1	38.3	477.6	85.4	53.9	—	102.5	26.8	244.5
	1962	9	179.9	344.1	36.4	438.5	88.5	73.9	—	63.8	18.2	228.2
	1961	9	358.6	345.3	38.4	468.7	95.5	55.0	—	72.5	21.5	328.9
	1960	7	592.9	112.2	29.8	253.0	30.5	40.7	—	68.0	14.3	153.7
$100-$250	1959	5	438.4	14.7	23.7	173.0	23.0	38.4	—	51.8	5.6	67.8
	1958	3	59.2	119.4	12.5	221.5	32.0	54.3	—	41.5	4.3	25.2
	1957	2	55.0	154.6	8.0	96.5	20.0	3.2	—	—	2.4	46.5
	1956	2	—	148.6	9.7	222.5	27.0	27.7	—	12.0	3.5	13.9
	1955	3	124.8	182.0	15.5	144.4	25.0	22.1	—	7.0	7.2	51.7
	1963	6	272.9	1477.3	116.9	475.8	207.5	96.2	—	—	46.1	408.2
	1962	5	232.2	1137.1	93.8	374.2	132.0	61.2	—	9.2	35.6	314.1
	1961	4	331.9	577.0	80.0	364.8	62.5	22.3	—	39.0	31.6	206.2
$250 and	1960	4	212.9	662.7	78.1	326.6	82.5	4.9	26.0	33.0	22.5	203.2
up	1959	4	216.2	582.4	67.7	258.6	72.5	24.0	26.0	18.5	18.9	180.3
	1958	3	190.6	306.5	53.3	146.0	50.0	8.2	36.0	21.0	15.7	153.8
	1957	3	231.0	225.8	53.0	233.0	32.0	38.7	37.5	38.0	15.4	90.8
	1956	2	219.0	210.0	52.3	16.0	20.0	2.6	50.0	31.0	11.2	70.7
	1955	1	50.0	105.3	37.7	—	—	—	50.0	26.0	4.2	21.1

*Includes borrowing from a finance company by one captive in the years 1957-1961.

Table 4

Liabilities of a Sample of Captive Finance Companies, Excluding GMAC, by Size of Company, 1955-1963

(As Percent of Total Claims)*

Asset Size Group by Year		No. of Cos.	Negotiated Short-term Borrowing		Accruals	External Long-Term Debt		Borrowing from Parent			Loss Reserves	Equity
Size in Millions	Year		Bank Loans	Comm'l Paper		Senior	Subdt.	Advcs. and Accruals	Long-Term Debt: Senior	Long-Term Debt: Subdt.		
	1963	11	42%	3%	4%	5%	3%	3%	3%	8%	2%	16%
	1962	10	55	6	5	2	3	2	3	6	1	18
	1961	15	54	—	2	8	1	6	—	9	1	20
	1960	20	54	—	6	—	—	12	—	3	1	24
Under $10	1959	22	40	—	5	8	—	9	—	4	1	34
	1958	25	44	—	6	7	—	13	—	5	1	24
	1957	26	41	—	6	15	—	12	—	6	2	19
	1956	24	26	—	6	23	—	22	—	—	1	22
	1955	24	26	—	5	11	—	22	—	10	1	26
	1963	17	38	11	4	12	2	6	—	7	1	25
	1962	23	44	8	3	13	3	3	—	7	1	22
	1961	15	48	11	1	12	—	4	—	6	1	17
	1960	11	39	5	2	28	—	3	—	8	2	13
$10-$25	1959	10	40	3	3	28	—	3	—	6	1	15
	1958	10	53	1	2	20	—	3	—	7	—	13
	1957	6	51	—	2	13	—	1	—	17	—	16
	1956	6	37	2	4	—	—	18	—	14	—	24
	1955	2	52	—	—	—	—	14	—	—	1	33
	1963	15	34	16	2	23	4	5	1	2	1	13
	1962	15	28	17	2	23	4	7	—	2	1	15
	1961	19	35	7	2	18	3	14	—	5	2	14
	1960	14	51	5	2	4	3	9	—	6	2	20
$25-$100	1959	12	60	2	2	6	1	7	—	8	1	12
	1958	12	55	3	4	5	2	10	—	8	1	11
	1957	11	66	1	3	5	2	1	—	12	1	8
	1956	5	57	—	4	11	5	11	—	8	2	3
	1955	3	59	—	5	19	5	2	—	—	2	8
	1963	11	23	16	2	30	5	3	—	6	2	15
	1962	9	12	23	3	30	6	5	—	4	1	15
	1961	9	20	19	3	26	5	3	—	4	1	18
	1960	7	46	9	2	20	2	3	—	5	1	12
$100-$250	1959	5	52	2	3	21	2	5	—	6	1	8
	1958	3	10	21	2	39	6	10	—	7	1	4
	1957	2	14	40	2	25	5	1	—	—	1	12
	1956	2	—	32	2	47	6	6	—	3	1	3
	1955	3	22	31	3	25	4	4	—	1	1	9
	1963	6	9	48	4	15	7	3	—	—	2	13
	1962	5	10	47	4	15	5	3	—	—	2	13
	1961	4	19	34	5	21	4	1	—	2	2	12
$250 and up	1960	5	13	41	5	20	5	—	2	2	1	12
	1959	5	15	40	5	18	5	2	2	1	1	12
	1958	4	19	31	5	15	5	1	4	2	2	16
	1957	4	23	23	5	23	3	4	4	4	2	9
	1956	3	32	31	8	2	3	—	7	5	2	10
	1955	1	17	36	13	—	—	—	17	9	1	7

*Detail may not add to 100% due to rounding.

course, derives from low loss rates, diversity of (uncorrelated) risks, and large numbers. If we assume the independence of probabilities, portfolio loss rates no worse than historic levels will make lender net losses virtually impossible in the ranges of debt/equity common to the independent finance companies and to captives, even if only modest numbers of receivables are held.[10]

Nonetheless, probabilities of loss on receivables are certainly not entirely independent, and the relative lack of industry diversity in the captives' assets may raise the covariance between cash flows from individual receivables and from the remainder of the portfolio above levels characteristic of the portfolios of independent finance companies. The embarrassment of a number of captives over the years is also a dramatic reminder that credit policies which allow extraordinary loss rates *can* result in equity loss, if not losses to creditors also. In addition, it has been pointed out elsewhere that characteristics of captive relationships with parent companies raise ambiguities for some creditors.[11] Despite these qualifications, however, it is true that the high liquidity of a captive finance company's assets makes it a shell of prime collateral value. The general creditors of such a company hold liquidation claims upon a nearly certain cash flow, and the certainty of the flow allows heavy proportions of debt in total financing.

B. Quantitative Limitations on Creditor Risk: Debt/Equity Ratios

Quantitative limitation of senior debt relative to a risk-bearing base–capital, surplus, and subordinated indebtedness–is the principal device used for limiting risk exposure of the captives' creditors. The limits imposed are almost always ratios of 3 or 4 to 1. One occasionally encounters higher ratios when parent guarantees are attached.[12] The lower figure loosely applies to the subsidiaries with higher proportions of supposedly high-risk wholesale paper; the higher limit applies loosely where retail paper is in clear predominance. Also, consumer paper in a captive's assets tends to be associated with borrowing ratios of 5 to 1, or even higher.

Table 5 summarizes data from Table 3 of the debt/capital base ratios, by size of subsidiary.[13] With allowance for year-to-year variability, the ratios suggest a positive association between size of captive and borrowing limit. There are only five instances recorded in all the observations of companies with over $100 million of assets where the ratio dropped significantly below 4. Ratios in the lower size classes have been irregularly lower, and seem to have been persistently lower for the $0-$10 million group than for the intermediate size groups.

Section V below emphasizes that captives in the upper size ranges enjoy a significant measure of independence of the banking system because of their access to the commercial paper market. It is quite likely that this bargaining position enables the large subsidiaries to stretch their capital bases further.

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[10] Fred Leonetti, "Risk and Return of a Financial Subsidiary", unpublished Masters degree thesis, School of Industrial Management, Massachusetts Institute of Technology, 1961. All this waives questions of outright mismanagement.

[11] Victor L. Andrews, "Captive Finance Companies," *Harvard Business Review*, July-August 1964, pp. 80-92.

[12] When there is enormous disparity between the sizes of parent and financing subsidiary, the attraction of a parent guarantee for a creditor is understandable and real. Otherwise, it seems superfluous. See Andrews, "Captive Finance Companies," *op. cit.*

[13] End-of-fiscal-year balance sheets are nearly always a seasonal low in assets and borrowing. Hence, the ratio between senior claims and the risk-bearing base will be at its low. The smallest captives tend somewhat more strongly than others to be lenders on wholesale paper where seasonality will exert its strongest influence.

Table 5

Ratio of Senior Liabilities to Capital Base*, By Size of Captive Company

Asset Size of Company (in millions)	1963	1962	1961	1960	1959	1958	1957	1956	1955
$ 0 - 10	2.4	2.6	2.3	2.6	1.6	2.3	2.8	3.4	1.7
10 - 25	1.9	2.0	3.2	3.3	3.6	3.6	2.0	1.5	1.9
25 - 100	4.0	3.5	3.2	1.9	2.9	3.6	4.9	5.3	5.7
100 - 250	2.6	2.8	2.4	4.0	4.9	4.5	4.3	4.7	5.7
over - 250	3.5	4.6	5.4	4.0	4.3	3.0	4.6	4.3	4.9

*Includes equity, loss reserves, and all subordinated debt.

Other risk limitation devices imposed by bankers are occasionally knitted together with limitations on debt/equity ratios. For example, one credit line agreement which limits borrowing to a 4 to 1 debt/capital base ratio also reads in part:

> The Credit Agreement between [name withheld] and the banks requires, among other things, that the Corporation maintain working capital, as defined in the agreement, [current assets less current liabilities without reclassification of receivables with maturities in excess of one year] equal to at least 25 percent of the outstanding amount borrowed from banks under the credit agreement and imposes certain limitations on borrowing, acquiring capital assets, and paying the principal of the subordinated indebtedness.

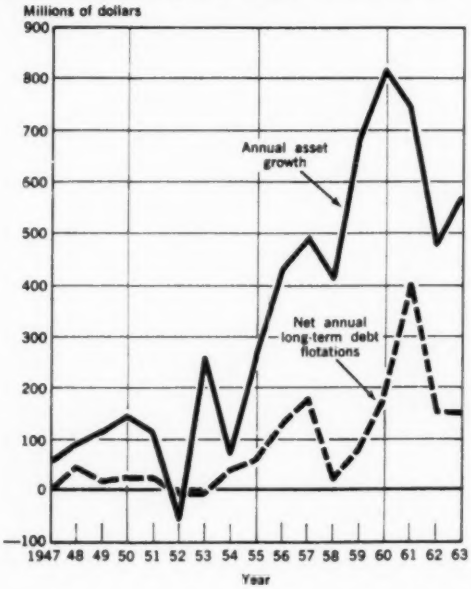
IV. *Use of Long-Term Debt*

A. Asset Growth and Debt Issuance

It is imaginable that the issuance of long-term debt by the subsidiaries is induced simply by asset growth and adherence by management to a target proportion of long-term debt-to-total[14] financing. In Chart 1, annual asset growth and net yearly flotations of long-term debt are plotted on the same time scale. Loosely, peaks and valleys in the two series coincide. Sometimes, however, net flotations rose as the pace of asset growth fell sharply and *vice versa*, and the pace of asset expansion outran flotations for several years at a time. Because of the looseness of this association and, more significantly, because this interpretation ignores some fundamental roles played by long-term debt in the structuring of claims, other relationships must be explored.

Chart 1

Expansion of Assets and Long-Term Debt Flotation by Captives Other Than GMAC



[14] The great majority of these issues are long-term, of 15-years maturity or more. Few are term loans.

B. Term Structure of Liabilities

Broadly, there are three options for the captives in the election of a term structure of financing. First, the term structure of debt could be managed so as to minimize interest costs.[15] This is feasible because there can be differences in short- and long-term interest rates at a moment in time, because these differences fluctuate through time, and because short- and long-term rates are rigidly related to each other mathematically. Such an attempt would necessarily involve captive-management in a series of successive moves substituting short- for long-term debt, and *vice versa,* since shifts in the term structure of interest rates require new structures of commitments in the futures markets for money. Second, the term structures of receivables and debt could be matched so as to freeze the difference between rates on each. Third, the term structure of debt could be employed to achieve a desired position of liquidity. It would only be coincidental if the structure chosen for this purpose also proved appropriate for cost minimization or hedging cash flows.

C. The Influence of Short- and Long-Term Rate Differentials

There seems to be no way to infer directly whether or how management has used the term structure of captive-company debt to minimize interest cost over rate cycles. Interviews of company officials revealed little evidence that the term structure of interest rates played a significant role in the planning of capital structure. Occasionally, it was asserted that long-term debt had been issued as a hedge to safeguard the earnings on outstanding receivables against fluctuating interest costs.[16] However, these policies are encountered infrequently.

With the lack of conclusive direct evidence, it is worthwhile to consider what may be learned indirectly of the subsidiaries' response to the term structure of rates. Through 1963, 118 separate new long-term debt issues by captive companies were tabulated. To eliminate the effect of a changing number of companies in the sample, a calculation was made, by year, of the number of long-term issues per company. This statistic is ranged in Chart 2 against the differential between yearly average yields on Aaa grade corporate bonds and four-to-six month commercial paper. The rate differential is employed here as a proxy of a yield curve. A positive differential, of course, implies an upward sloping yield curve, generally thought to be associated with market anticipations of rising interest rates, and conversely.[17] Presumably, if

[15] For a recent interpretation of this old view of the term structure of interest rates, see David Meiselman, *The Term Structure of Interest Rates,* Englewood Cliffs, N.J.: Prentice-Hall, 1962, Ch. 1 and Ch. 2, sections 2.2 & 2.4.

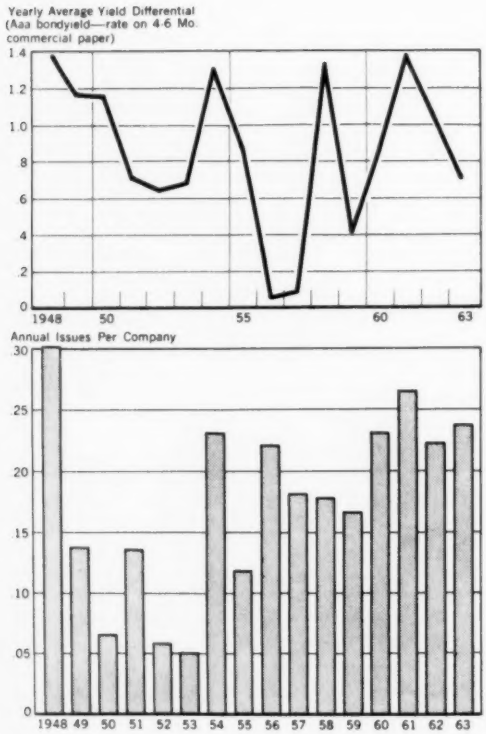
[16] Matching of specific receivables with debt contracts is sometimes done in these instances, occasionally in collateral trusts. This is true of financing particularly long-lived, high-priced (relative to the borrower's resources) equipment with high collateral value.

[17] See Meiselman, *op. cit.;* and Roland Robinson, *The Management of Bank Funds,* 2nd Ed., New York: McGraw-Hill Book Company, 1962, Ch. 19. Clearly, the crudity of the measure employed here will not reflect refinements such as "humps" or "shoulders" in term structure of yields, but it does reflect adequately the slope in yield curves for corporate rates. Indeed, differentials shown here are generally consistent in their relative magnitudes with the slope of basic yield curves for corporate debt. Simple correlation of the yield differential between one-year and 30-year corporate bonds as shown in yearly basic yield curves with new issues per company produced a lower correlation than the same correlation employing the yield differential cited here. Use of a differential between annual averages conceals significant variation within years. Issues per company cannot be stated for time intervals finer than a year, however, and so it is necessary to work in corresponding time intervals in the rate histories.

the flotations of the subsidiaries were sensitive to rate expectations *and* the captives' managers held anticipations implied in the term structure of interest rates, issues per company would be high in periods of a wide long-short rate differential and *vice versa*. The evidence of Chart 2 is equivocal. The years 1954 and 1961, for example, saw a relatively wide rate differential and the number of issues per company was relatively high in both years. However, the same is not true of 1958. Also, years of a low differential, such as 1956, 1957, and 1959, did not produce a particularly low value for issues per company. Numerical calculation shows a concentration of new issues in years of extreme rate differentials, for example, 1.2-1.4 percent, but short of that extreme there is no palpable sensitivity of new issues to rate structure.

Chart 2

New Long-Term Issues Per Company and Yield Differentials



D. A Test of the Influence of a Target Level of Long-Term Debt and Rate Differentials

Multiple regression and correlation analyses were used to test the effect on new issues per company of long-term debt as a fraction of total financing in the previous year, and of lagged and unlagged differentials between yearly average rates on Aaa bonds and four-to-six month commercial paper. If a target level of debt in total financing operates in captive financing policies, high levels in one year would tend to be followed by low rates of issuance in the next year, and *vice versa*. The influence of interest rate differentials would be as hypothesized above. Coefficients of determination derived from the analyses were not significantly different from zero. The resulting net regression coefficients of the interest rate differential were not statistically significant, and partial correlation coefficients were low for both the lagged and unlagged associations. Similarly, for the relationship between new issues per company and the previous year's level of long-term debt, statistically insignificant regression and partial correlation coefficients were obtained in company with lagged and unlagged interest rate differentials. Moreover, the sign of the coefficient for the previous level of long-term debt did not indicate an inverse association with new issues.

We can tentatively[18] conclude that the captives have shunned problematic reduction of interest cost through

[18] These data are not absolutely conclusive. The necessity to employ the difference between yearly averages of short- and long-term rates introduces ambiguities about response to rate relationships within short periods. This ambiguity is compounded by lags in issuer response

manipulation of term structure, and that there is no statistical evidence of the influence of a target ratio of long-term debt-to-total financing in the captives' policies.

Other evidence also implies that management of the captives was willing to concede the freedom to play upon the term structure of rates. Many of the captive-company long-term note agreements examined by the author incorporate nonrefunding and/or redemption limitations eliminating or circumscribing the ability to refinance when (and if) rates fall in the future, thus redistributing some of the risk of rate fluctuation. Since there presumably is a higher interest rate which the captives could have paid to induce lenders to supply funds without these limitations, it follows that they preferred to forego freedom with respect to the term structure of debt and, by implication, the term structure of rates.

E. Long-Term Debt in the Maintenance of Liquidity

The preponderance of evidence points to the use of long-term debt by the captives principally as a determinant of liquidity. In this analysis, we start from the basic truth that parent and wholly-owned subsidiary comprise a single command center. The officership of parent and captive usually overlaps heavily, so that no question of conflicting policy arises. Given this, it would seem that term structure of debt must be viewed within a perspective of unified parent-captive liquidity. Unless the liquidity of the parent and captive *is* managed as a unit, there is a risk of incurring the cost of redundant financing; for example, the parent might have excess cash while the captive was borrowing from external creditors.

The means for joint liquidity control are readily at the hand of management. Deferral of payment of accrued expenses owed by subsidiary to parent, or the reverse, will effect near-term, small-scale transfers of liquidity. For companies with assets of less than $100 million, the behavior of accruals and advances owed to the parent, shown in Tables 3 and 4, rather strongly implies that they have been used for temporary liquidity transfers. Outright loans also transfer funds between the two, and the balance sheets of parents and captives contain many examples evidencing these kinds of liquidity transfers. But, more fundamentally, operating agreements typically commit a parent company to sell on variable terms to its financial subsidiary some *variable part*[19] of its notes receivable generated by operations. Discretionary control of the fraction of receivables sold and of the terms of sale is all that is required for discretionary allocation of liquid assets and the burden of their financing between parent and captive. Since the means are available to a command center operating with the incentive to manage parent and captive as a unit, it must be concluded that consolidated figures are relevant in measures of liquidity.

The term structure of debt can be used to regulate the pressure of short-term liabilities against liquidity. With given assets, greater long-term debt diminishes the weight of short-term debt and *vice versa*. In the following, we shall consider

to rate developments introduced by negotiation procedures in connection with long-term debt issues. An additional perplexity is that the series on rate differentials plotted in Chart 2 has numerous turning points; if an issuer responds by adjusting term structure in the neighborhood of a turning point, the likelihood that he will respond again is probably reduced, and so a tabulation of issues per company through time cannot be perfectly representative of responses.

[19] In the case of the rare exceptions, this reasoning will not apply. Also, the reasoning with respect to the captive's earnings from the sale price of the receivables does not apply without qualification to companies which solicit outside business.

the role of captive-company term structure in regulating the amount of short-term debt relative to the consolidated liquid assets of parents and captives. Since financing of the subsidiary by the parent does not affect consolidated liquidity,[20] it is permissible to work with captive company long-term debt exclusive of debt to the parent as an appropriate variable.

A positive policy of liquidity-risk avoidance would result in maintenance of short-term liabilities no larger than the stock of liquid assets.[21] A commonly employed balance sheet liquidity ratio will serve the purpose of testing behavior of the parent-captive liquidity units in this respect. The "acid-test" ratio relates cash and cash inflows scheduled in accounts receivable to current liabilities. Such a ratio computed from *consolidated* balance sheets will reflect the total of virtually sure liquidity available to parent and captive against possible near-term cash outflows. If an amount equal to a captive's long-term debt is added to consolidated current liabilities, the resulting acid-test ratio will show what consolidated liquidity *would have been* without the captive's long-term debt. The ratio with this adjustment will be referred to here as the "adjusted acid-test" ratio.[22]

A number of companies have either published or made enough information available to the author to permit computation of the adjusted ratio.[23] Scatter diagrams of the proportion of captive company external long-term debt in total financing against unadjusted acid-test ratios, and against adjusted ratios for a group of 31 companies, appear in Chart 3 for the years 1960 and 1961. No systematic association between the proportion of long-term debt in total financing and unadjusted ratios would be anticipated. Because this association is *ex post*, most of these ratios should lie upwards of a "solvency minimum" in the neighborhood of one. The left hand panels of Chart 3 bear out this supposition.

The effect on the adjusted ratios of adding the captive's long-term debt to short-term liabilities is shown in the contrast of the right hand panels, where the ratios affected are moved toward lower liquidity readings. The extreme lowness of some of the ratios on the liquidity scale is indicative of the quantitative importance of the long-term debt of the captives in their respective consolidated liquidity positions.[24]

[20] Note that this is not inconsistent with viewing all or some part of parent financing as a permanent commitment, i.e., long-term financing.

[21] If the textbook-venerated "ideal formula" (See Bion B. Howard and Miller Upton, *Introduction to Business Finance*, New York: McGraw-Hill Book Company, 1953, Ch. 13, pp. 310-314) and the rule oft-repeated by practitioners that "short-term assets should be financed short-term and long-term should be financed long-term" were applied to the financing of cash plus receivables, the policy described here would result.

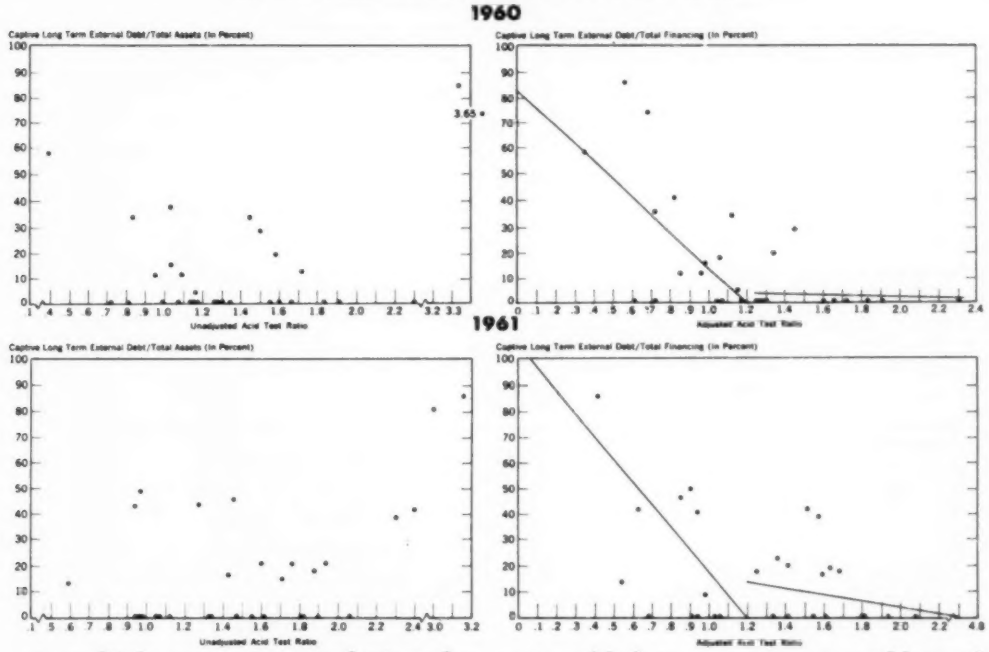
[22] The use here of these ratios as a quantitative expression of liquidity for correlation and regression is not meant to imply that the ratio itself is a focus of decision-making. The decision-focus is "liquidity".

[23] The most frequently encountered stumbling block is that the financial statements fail to disclose the volume of receivables held with life in excess of one year, or otherwise to divulge the information to permit a computation of quick assets. There is no discernible reason to suppose that a nonrandom sample of the companies discloses this information, however, and therefore there is no apparent reason why their data could not be employed in correlation analysis. At this point, it is worth noting that error in the estimation of these ratios will depress the coefficients derived later by employing them as independent variables in regression and correlation.

[24] In general, ratios for 1961 below one will lie farther to the right, and ratios above one will lie farther to the left, than their 1960 counterparts. Recession in 1960 and revival in 1961 depressed and expanded receivables, respectively. Simultaneous corresponding movements of current liabilities will move the ratios below one upward. An opposite effect exists for the ratios above one.

Chart 3

Captive Long-Term Debt as a Proportion of Total Assets and Consolidated Liquidity Ratios, 1960 & 1961


1960
Captive Long Term External Debt/Total Assets (In Percent)
Unadjusted Acid Test Ratio
Captive Long Term External Debt/Total Financing (In Percent)
Adjusted Acid Test Ratio
1961
Captive Long Term External Debt/Total Assets (In Percent)
Unadjusted Acid Test Ratio
Captive Long Term External Debt/Total Financing (In Percent)
Adjusted Acid Test Ratio

A multiple regression employing the logarithm of company asset-size and adjusted acid-test ratios as independent variables explaining the proportion of external long-term debt in total captive company financing was fitted to the data for 1960 and 1961 above and below the solvency minimum.[25] We are concerned not only with the question whether long-term debt is used to structure liquidity, but also the question whether, for a given parent or captive, the *subsidiary's* capital structure has been employed this way. Of course, the *parent's* term structure could be manipulated to produce the desired limitation of short-term debt, and if this is generally true, no systematic relationship in a broad sample will exist between joint liquidity and subsidiary term structure. A third independent variable was added to overcome a problem of common elements in regression terms. Long-term debt of the captive appears both in the numerator of the dependent variable and in the denominator of the adjusted acid-test ratio. By incorporating it as a separate independent variable, we eliminate its effects in partial correlation.

Table 6 summarizes some of the results of the regressions and correlations based on 1960 and 1961 data.[26] First, consider the values for the functions fitted to data below the solvency minimum, i.e., adjusted acid-test ratios below 1.2. Regression coefficients and squares of the partial correlation coefficients for the size variable, X_2, indicate that it has only modest influence. Moreover, the regression coefficients are small relative to their stand-

[25] Fixed by inspection and experimentation at an adjusted ratio of 1.2.

[26] Observational error on the liquidity ratios (see above, fn. 22) undoubtedly has reduced the correlation and regression coefficients significantly.

Table 6

Summary of Regression Results: Term Structure of Captive Financing as a Function of Size and Parent-Captive Liquidity

(Figures in parentheses are standard errors)

Item	Adjusted acid-test ratios < 1.2		Adjusted acid-test ratios > 1.2	
	1960	1961	1960	1961
a	.853	1.21	.058	.179
$b_{12.34}$	−.076 (.099)	−.181 (.149)	−.008 (.029)	.055 (.063)
$b_{13.24}$	−.694 (.188)	−.886 (.286)	−.021 (.053)	−.112 (.142)
$b_{14.23}$	.004 (.000)	.004 (.000)	.002 (.000)	.001 (.000)
$r^2_{23.14}$	.053	.131	.016	.049
$r^2_{13.24}$	.509	.514	.026	.049
$r^2_{14.23}$	.359	.377	.620	.209

Test equation: $X_1 = a + b_{12.34} X_2 + b_{13.24} X_3 + b_{14.23} X_4$
X_1 = captive company external long-term debt as a fraction of total financing
X_2 = log of captive company assets in millions of dollars
X_3 = adjusted acid-test ratios
X_4 = long-term external captive debt in millions

ard errors. The neutrality of size in this sample is probably traceable to the fact that all the subsidiaries are large enough to float long-term issues in size ranges where cost of flotation exerts little impact. On the other hand, the size of the coefficients for the adjusted acid-test ratios, X_3, makes clear that through the cross-section small changes in consolidated parent-captive liquidity exert material influence over the term structure of captive company debt. The sign of the coefficients indicates inverse association, i.e., higher proportions of captive long-term debt are associated with low adjusted acid-test ratios (which imply illiquidity without the captive's longer debt maturities). The t-ratios of these coefficients are significant at the one percent and five percent levels for 1960 and 1961, respectively. Squares of the partial correlation coefficients for X_3 show that correlation with consolidated liquidity accounts for a reduction of about one-half of the unexplained variance in term structure when size and the common element in terms, X_4, are eliminated.

Next, contrast these results with those derived from fitting the function to the data for both years in the region of adjusted acid-test ratios lying above 1.2. Coefficients for the size variable again signify no systematic effect of size. Low regression coefficients for the liquidity ratios are consistent with the anticipation that no long-term debt will be issued by subsidiaries having joint liquidity positions above the solvency minimum. Low squared coefficients of partial correlation are consistent with the anticipation that adjusted ratios above the solvency minimum could lie to the right indefinitely (which implies no correlation) on the horizontal axis of the scatter diagram.

These data are convincing evidence that joint liquidity positions are systematically associated with term structure of captive company debt and exert a significant influence over it.[27]

[27] A coefficient of determination of a regression fitted without segmentation of adjusted acid-test ratios is lower for the functions, both for

V. *Negotiated Short-Term Financing*

Captive short-term financing policies are responsive—depending on the scale of borrowing, its economies, and the cost of access to the open money market—to the pull of the usual differential between bank and open money market rates, to cyclical variations of the differential, and to structural differences of supply of funds to the dealer and direct placement segments of the open market. In short, a combination of micro- and macrofinancial influences affects the captives' short-term debt policies.

A. Recent Growing Use of Commercial Paper by the Captives[28]

In Table 7, there is presented a summary of the captives' indebtedness on commercial paper, broken down by directly- and dealer-placed totals, and a comparison, at year end 1950-1963, with the volume of commercial paper outstanding as reported in the *Federal Reserve Bulletin*. The absolute volume outstanding attributable to the captives rose by twenty-five fold from $76 million in 1950 to almost $1.9 billion in 1963. After the late 50's, the great bulk of absolute growth was in directly-placed paper.[29] The share of this sample of subsidiaries in the total outstanding grew steadily from less than one-tenth in the early years to more than 28 percent in 1963.

After late 1957, the difference between the prime bank rate and the 90-day prime commercial paper dealer rate was substantial, and was in excess of a full percentage point for nearly all of the period from mid-1960 to mid-1963. Basically, it is this attraction that accounts for the burgeoning of commercial paper sales by the captives.

Inspection of annual net changes in bank loans and commercial paper outstanding, as shown in Table 2 for the entire sample, suggests that the distribution of captive debt between the bank and open loan markets has been sensitive over short periods to the relative interest rates in these markets. Regression and correlation was undertaken to test the sensitivity of the captives' policies. Ratios of bank loans outstanding in one year-to-bank loans in the previous year were divided by corresponding ratios of commercial paper. This variable was then regressed on, and correlated with, the annual averages of the monthly average differential between the bank prime rate and the 90-day dealer rate on commercial paper over the years 1948-1963. The constant of the resulting regression equation indicates that, with a zero rate differential, the ratio of yearly bank loan growth-to-yearly commercial paper growth was

1960 and 1961, than for the corresponding figures derived from the regression outlined here. It should be mentioned, too, that the same regressions described here were performed with the percentage of captive long-term debt-to-total external debt as the dependent variable. Lower correlations were obtained uniformly. The economic difference is that the proportion of long-term debt in total external debt ranged against adjusted acid-test ratios ignores the fact that consolidated receivables (in the numerator of the acid-test ratio) are in part equity financed. Hence, this comparison would ignore the liquidity support implicit in equity committed to captive receivables. Captive long-term debt as a proportion of its total financing, on the other hand, is commensurate with policy toward total financing of stocks of cash and receivables.

[28] The author is greatly indebted to Goldman, Sachs and Co., and to anonymous issuers of commercial paper for exceedingly generous cooperation in work on this phase of the captives' financing.

[29] Through 1963, a half dozen of the largest captives in addition to GMAC had undertaken direct placement. So far as the author knows, they were: Sears Roebuck Acceptance Corp., General Electric Credit Corp., Ford Motor Credit Co., International Harvester Credit Corp., Montgomery Ward Credit Co., and Westinghouse Credit Corp. In 1964, J. C. Penny Credit Corp. started direct sales.

Table 7

Captive Company* Commercial Paper Outstanding, 1950-1963

(Dollars in Millions)

Year	No. of Cos. Tabulated	Year-End Total Outstanding†	Absolute Totals of Captives Tabulated			As Percentages		
			Total‡	Directly Placed	Dealer Placed	Total	Directly Placed	Dealer Placed
1950	1	$ 920	$ 18	$ —	$ 18	100	—	100.0%
1951	1	1,331	31	2	29	100	6.5	93.5
1952	2	1,745	121	66	55	100	54.5	45.5
1953	2	1,966	176	109	67	100	61.9	38.1
1954	3	1,924	203	100	103	100	49.3	50.7
1955	3	2,008	220	120	100	100	54.5	45.5
1956	3	2,183	275	185	90	100	67.3	32.7
1957	4	2,672	306	191	115	100	62.4	37.6
1958	8	2,751	426	254	172	100	59.6	40.4
1959	10	3,202	602	420	182	100	69.8	30.2
1960	16	4,497	819	504	315	100	61.5	38.5
1961	23	4,686	1,056	755	301	100	71.5	28.5
1962	22	5,988	1,662	1,321	346	100	79.5	20.5
1963	26	6,747	1,887	1,456	431	100	77.2	22.8

*Data on captive company totals exclude GMAC.
†As reported by the *Federal Reserve Bulletin*.
‡These figures will differ somewhat from those shown elsewhere in this article because they were tabulated from a special mail confirmation of the figures shown. Minor corrections resulted from the confirmation. Comparison, however, will show that the differences are not material.

1.39, reflecting a secular reliance upon banks to finance growth in the absence of a rate superiority of commercial paper. The regression coefficient which resulted was −.499, indicating that an increase of a percentage point in the bank-commercial-paper rate differential was associated with a reduction of one-half in the ratio of yearly bank loan growth to the corresponding yearly commercial paper growth. However, the simple correlation coefficient was only −.54, reflecting a loose relationship, though the true correlation undoubtedly is stronger.[30]

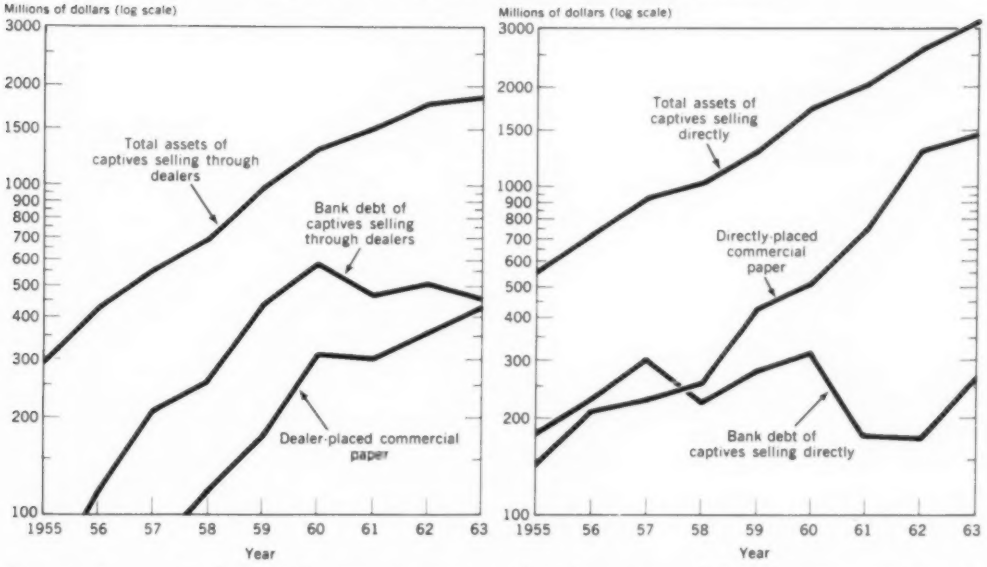
Chart 4 illustrates a point vital to the reasoning in the sections below. Total assets of subsidiaries selling open market notes directly and of those selling through dealers are plotted, by year, 1955-1963,[31] together with the volume of commercial paper and bank loans outstanding from each group. If we may take total assets as an index of demand for financing, the fact that the demands of the direct sellers did not exceed that of the others until the very late 1950's or early 1960's is most noteworthy. Even then, the difference was not marked. The series on short-term indebtedness of the two groups show clearly that, ultimately, reliance by the direct sellers upon banks dwindled to proportionate insignificance, while for captives selling through dealers, bank debt remained the principal source of short-term financing. Moreover, directly-placed paper tended to outrun dealer-placed paper in volume outstanding and rate of growth well before any differences in demand between the two groups became evident. If demand differences are not responsible, supply conditions in the

[30] Observational error on the dependent variable has depressed the value obtained for the correlation. Bank loan and commercial paper totals were taken from balance sheets at various company fiscal year closing dates during the calendar year, and are aggregated for yearly periods which incorporates error.

[31] Selling practices employed in 1963 were the basis of classification of subsidiaries. In one or two instances, there were brief periods during the years covered when companies selling directly in 1963 placed paper through dealers, but the amounts involved were negligible for purposes here, and the periods were brief.

Chart 4

Total Assets and Commercial Paper Outstanding of Captives Selling Directly and Through Dealers



direct-sale and dealer-placement segments of the open market are the probable cause of differences in financing patterns.

B. Differentiation Among the Captives With Respect to Use of the Open Market

As one studies the captives, a picture emerges of some which limit their negotiated short-term financing to bank debt only, a significant number of intermediate-sized ones whose short-term borrowing is palpably influenced by money market rate differentials and availability of open-market funds, and a small third group which finds the permanent differential between the bank and open market rates, together with an adequate quantity of funds available, to be a sufficiently potent attraction to warrant primary reliance upon direct sale of open market notes.

A factor which accounts for the mixing of open market notes and bank debt in the short-term debt of some captives is the choke-rein held by the banks. The banks seem able to exercise enough informal power to limit the fraction of commercial paper in the short-term borrowing of the captives that lack easy access to private placement. If the banks are able to limit use of the open market by some captives, they may be capable of stopping others altogether. Managerial lethargy may also be a factor in explaining why many captives rely solely on banks for short-term debt. Quality rationing also operates, but the primary test of the rating agency would exclude few of the captives discussed here.

The core of the cost superiority of commercial paper is the persistent differential between the prime bank rate and the prime commercial paper rate. There is also a saving on compensating balances. The usual agreement between a bank and a borrower specifies that a deposit balance equal to a given percent of a credit line will be maintained when lines are

active, but that a lower percentage applies against idle lines. As given loan needs are met with open market notes, the accompanying reduction of bank borrowing also effects a reduction of required compensating balances.[32] Also, the balances are financed, in essence, at the lower open market rate.

These savings are open to all potential issuers of open market paper among the captives.[33] The costs of access and the availability of funds will determine whether these savings are sought through the dealer or the direct placement markets. The overhead cost of maintaining an apparatus for private sale must be netted against possible savings from circumventing the ¼ percent per annum dealer commission.[34] The incremental costs required to save this commission include fixed or semi-fixed salaries of field personnel, the costs of maintaining their activities and supporting office facilities, and variable money handling costs for each transaction.[35] It appears from data shown to the author that in direct placement approximately $700 of variable cost annually supports about $1 million of average daily balances outstanding (ADO). If gross savings of dealer commissions are $2500 per $1 million of ADO's (¼ per cent x $1 million), the sav-

[32]. Financing subsidiaries employing commercial paper limit the open market's risk of evanescent fund supplies by maintaining bank deposits to reserve unused lines of credit. At balance sheet dates in 1961, the six captives selling directly averaged a trifle more than dollar-for-dollar of commercial paper outstanding relative to idle bank lines. Fourteen companies selling through dealers averaged commercial paper outstanding equal to 51 percent of open lines. The excess of balances over transactions requirements is probably large for all but the largest captives, because when administrative services are supplied by the parent, as is nearly always true in the case of small- and intermediate-sized ones, transactions to be financed from cash balances are low in volume and number. The cost of borrowing deposits idled in excess of transactions requirements is a precautionary reserve cost which is an offset to the savings described above.

[33] Added minor savings, perhaps an eighth of a point, are sometimes in fact achieved in direct placement by beating the base-rate on comparable maturities of dealer-placed paper. Moreover, if the yield curve is upward sloping, the borrower profits from cultivation of the short-end of the market, and direct sellers are free to exploit maturity rate differences. In the range of maturities under 270 days (the uppermost commercial paper maturity) the yield curve almost always slopes upward. Perhaps the most obviously successful use of these flexibilities has been made by Sears Roebuck Acceptance Corporation (SRAC). Paper as short as five days has not been uncommon in private placement, but SRAC's experience indicated the existence of a market for very short (three-five day or even less) maturities in the form of "bumps" in cash flow of corporations difficult for their managers to invest otherwise, particularly for weekends. Consequently, in April of 1961, SRAC began offering notes written with maturities in this range, and this contributed further to a shortening of the maturities of its notes outstanding which had been underway previously. An article in a financial daily quoted the SRAC near-term rate at 2¼ percent when 30-59 day notes were offered at 3 percent, with a trifle higher yield at discount. The average maturity of paper placed in 1957 was 133 days; in 1960, this had been somewhat more than halved, and in 1961 and 1962 average maturity fell to 36.4 and 33.9 days, respectively.

On the other hand, some captives have resorted to concessions, such as one-eighth point on rates across all maturities on million dollar deals, in the early phases of their direct placement as a means of rapid market pentration. Another author has pointed out, however, that there is a persistent differential of about one-half point between dealer rates and direct placement rates. This, however, is a comparison of dealer rates with rates obtained by only one direct seller. See Richard T. Selden, *Trends and Cycles in the Commercial Paper Market*, New York: National Bureau of Economic Research, 1963, p. 68.

[34] The commission is higher to less powerful issuers, reaching as high as ½ percent in some instances.

[35] Surprisingly few salesmen are required; a few years ago the maximum maintained was eight by GMAC, and substantially fewer by the smaller finance companies.

ing contributed toward the covering of overhead is about $1800 per $1 million of ADO. The smallest volume of commercial paper outstanding from a captive after a full year of active direct placement was $45 million, perhaps suggesting the size requisite for direct sale. Thus, in terms of possible savings, direct placement is favored only for the large issuer, but differences in cost of access are not as powerful a consideration as availability of funds.

C. Supply of Funds to the Dealer and Direct Placement Segments of the Open Market

The customary flexibility and convenience of direct placement afford the issuer the opportunity for exploitation of a market in which suppliers have cash flows not necessarily consonant with the rigid maturities offered in the dealer market.[36] However, other more powerful considerations also point to greater elasticity of supply in the direct-placement market.

One author recently argued to good effect that analysis of supply in the open money market must start with the observation that treasury bills, directly-placed open market paper, and dealer-placed paper are close substitutes for each other in competition for lenders' dollars.[37] *Ceteris paribus*, the elasticity of supply to each of these segments of the money market must be high because of the interchangeability of these instruments in lenders' portfolios.

However, differences between fund suppliers result in substantially different elasticities of supply to the direct placement and dealer markets. Although the dependence of commercial paper dealers upon the country banks as suppliers of funds is diminishing, the bulk of the dealers' placements is still made with them.[38] Direct placements, on the other hand, are made overwhelmingly with nonfinancial corporations.[39] Significant expansion of dealer placements would involve a change of market and marketing apparatus. In contrast, the direct sellers have many more choices available to them in setting terms, and they can push field selling more vigorously and with greater numbers of large investors than can the dealers.

Moreover, marginal opportunity costs do not behave alike for the country banks and the nonfinancial corporations. In order to draw increasing funds from the banks, open market dealers must bid these funds away from the banks' margin of indifference between the low rates, liquidity, and virtually unassailable quality of commercial paper, and the considerably higher rates, less liquidity, and (probably) greater risk on a wide spectrum of other loan options. Consequently, steep increases in offered rates would be required for dealers to raise significantly larger amounts at a given time. Nonfinancial corporations, on the other hand, have few options in investing cash reserves, since all of their investments, except for real assets, pay closely similar rates.[40] Hence, for sellers of directly-placed commercial paper to bid funds away from competing outlets, only relatively slight rate increases will be required. From the differences in marketing apparatus and in the marginal opportunity cost schedules of the suppliers, it seems fair to surmise that elasticity of supply is appreciably higher in the direct than in the dealer market.

[36] Moreover, private sales enable the issuer to put forward informal bail-out assurances in the event of unforseen lender need. Most issuers do not promise such a contingency resort, but to the best of the author's knowledge accommodation has not been denied to embarrassed lenders.

[37] Selden, *op. cit.*, pp. 67-81.

[38] *Ibid*, p. 29.

[39] *Ibid*, Chart 3, p. 26.

[40] It is generally assumed that liquid and real assets are not really rival investments. If true, their comparative rates are not relevant here.

The behavior of the captive companies with respect to the bank loan, direct-placement, and dealer-placement segments of the open market can be summarized as follows. After 1957, but particularly after mid-1960, increasing supplies of funds in the open market invited short-term financing by the subsidiaries at rates consistently and materially lower than bank loan rates. Intermediate-sized captives, confined by scale of requirements to the use of dealers, moderately expanded commercial paper in their financing, principally on the basis of increased dealer sales to country banks. Large subsidiaries can sustain the overhead and inconvenience costs of access to direct placement. Even though the aggregate demand of this group did not significantly exceed that of the companies selling through dealers, the greater elasticity and cyclically-induced movements of the supply curve to the direct-placement segment of the market resulted in an expansion of directly-placed open market notes outstanding to a level several times the size of outstanding dealer-placements.

VI. *Summary and Conclusions*

The very briefiest restatement of the principal findings will serve adequately as a summary. Broadly, with respect to the term structure of external debt, the financial managers of the captives have chosen safety in preference to a gamble on interest rates, behaving as liquidity-risk averters rather than as interest-rate speculators. However, within the short-term component of debt, the persistent differential in interest rates between the bank and open money markets, and the secularly increasing absorptive capacity of the latter, have induced substantially enlarged reliance upon commercial paper, particularly by direct sales.

Beyond this, it is appropriate to enlarge upon some implications of our findings. One can hardly help but speculate that policy toward term structure has been needlessly lopsided, even if it is granted that a penchant for liquidity-safety should dominate. In the face of a far shorter maturity range on an entire portfolio of receivables, the customary 15-25 year maturities on long-term debt of the captives entail risks of their own. A reduction of receivables would lead to redundancy of funds; commitments to long-term debt extending over periods of favorable rate developments may bind the firm to unnecessarily high costs.[41]

Instead, managers might consider financing a part of their portfolios through frequent flotation of term loans approximately matched in maturity with newly-acquired notes receivable. This would provide "hedged" cash flows, and would freeze-in the difference between lending and borrowing interest rates.[42] The borrower could combine this with a portion of short-term financing fashioned according to his desire to attempt interest-cost minimization versus liquidity-risk. It is curious, too, that stand-by arrangements with lenders have not been coupled in practice with the assumption of risk toward liquidity structure, term structure of rates, or extra-heavy reliance upon commercial paper.

Officers of both short- and long-term lenders argue that the segregation of receivables in a captive should enhance total borrowing capacity. While it is easy

[41] To be sure, nonprice concessions from lenders in debt contracts can mitigate both these risks. But it would seem that employment of intermediate-term maturities would substantially eliminate the first risk and reduce the second without necessitating a trade-off between interest rate and nonprice terms. Incidentally, examples of materialization of both these risks for the captives can be cited.

[42] Red tape of repeated note issuance could be slashed, perhaps, by use of collateral trust agreements between a given borrower and lender which adapt the features of shorter-term receivables financing arrangements.

enough to see that individual creditors, or classes of creditors, may benefit[43] from collateral segregation, it is not easy to see that, if liquidity and cash flows are the protection of creditor rights, segregation of parts can enhance total borrowing capacity. Cash and earnings flows and liquidity stock can only be divided among parent and captive, not multiplied. The administration of liquidity of parent and captive as a unit, which we have found here, is evidence of the tacit recognition of this fact by company management. If debt capacity has been enhanced by the existence of a captive, it has been dependent upon market imperfections or the shifting of lender preferences between risk and income.

[43] Andrews, "Captive Finance Companies," *op. cit.*

►STANLEY SILVERBERG

Bank Trust Investments in 1964

At the end of 1964, trust departments of commercial banks had investment responsibility for assets of approximately $155 billion, of which about $50 billion represented employee benefit accounts. In addition, bank trust departments provided investment management for agency accounts with assets of at least $35 billion.

These estimates are based primarily on data provided to the Office of the Comptroller of the Currency by national banks in their 1964 Trust Department Annual Reports. Figures on trust income, other trust surveys, and a sampling of trust examinations of state-chartered banks afforded the basis for converting national bank figures into estimates for all commercial banks.

The first section of this article analyzes the trust figures for national banks. The second section explains the bases for our estimates of trust assets for all commercial banks.

I. *Trust Assets of National Banks*

In their 1964 Trust Department Annual Reports, 1,564 national banks[1] reported having investment responsibility for trust assets of $75.2 billion, $20.8 billion of which were assets of accounts where national banks acted as trustee for employee benefit plans.

Table 1 lists the distribution of trust assets where national banks exercised investment responsibility. More than 59 percent of these assets were invested in

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[1] Included in all references to trust assets of national banks are the assets of nonnational banks in the District of Columbia, and the assets of some affiliates of national banks which voluntarily furnished the Comptroller's Office with trust asset data.

Table 1

Assets of Trust Accounts Where National Banks Have Investment Responsibility (Dollar Amounts in Millions)

Assets	Amount	Percent of Total
U.S. Government & Agency Securities	$6,049	$8.3
State, County, Municipal Securities	5,478	7.5
Other Bonds	9,382	12.9
Common Stock	43,049	59.1
Preferred Stock	1,199	1.6
Mortgages	1,634	2.2
Real Estate	2,698	3.7
Miscellaneous	1,139	1.6
Own Bank Time Deposits	853	1.2
Other Bank Time Deposits	316	.4
Savings & Loan Shares	224	.3
Demand Deposits	912	1.3
Not Classified*	2,321	—
Total Assets	75,223	100.0

* Includes assets of late-reporting banks, the assets of some accounts for which asset distribution was not available, and the $1,148 million in assets of bank trust departments having investment responsibility for assets of less than $5 million. Percentage distribution was computed exclusive of these assets.

common stock; about 52 percent of the employee benefit accounts, and approximately 62 percent of the other accounts. A similar table for 1963 showed national banks having trust assets of $64.1 billion, 56.4 percent of which were invested in common stock.[2]

Several factors prevent any precise estimate of year-to-year increases in trust assets of national banks. The 1964 figures include banks that converted from state to national status during the year. In addition, several national banks included accounts in their 1964 report that were excluded in 1963, and vice versa.[3] These changes resulted in an estimated $1 billion increase in the 1964 trust figures, thus suggesting a year-to-year *net* increase in trust assets of approximately $9 billion (about 14 percent). Approximately $5 billion of this increase in trust assets of national banks resulted from common stock price appreciation, leaving an increase of about $4 billion to be accounted for by the net inflow of funds into bank trust departments. Of this $4 billion figure, about half can be explained by the more than 10 percent inflow of funds into employee benefit trusts. This would suggest a net inflow of about $2 billion into other bank trust accounts—an increase of about 4 percent. Slightly different assumptions about stock price appreciation[4], or about variations in asset

[2] Stanley Silverberg, "Bank Trust Investments: Their Size and Significance," *The National Banking Review*, 1, June 1964, p. 579.

[3] Two banks which converted to national status (Provident National Bank of Philadelphia, and Mercantile Trust Company, N.A. of St. Louis) have sizeable trust departments. In addition, trust assets of some national bank affiliates were included in the 1964 figures, but were not included in 1963. With respect to asset coverage, the most significant changes pertained to the exclusion of certain agency accounts in 1964 that were included by some banks in their 1963 reports.

[4] Estimates of stock price appreciation depend on assumptions regarding investment performance, but even assuming that performance is in line with market averages, we still face a problem in determining the appropriate period for measuring stock price changes. Some banks provided market values as of December 31 in both their 1963 and 1964 reports, and for these, bank-stock price indexes may provide a reasonable measure of price appreciation. But, for trust accounts reviewed on different dates

coverage, could easily raise or lower the estimated inflow of other trust accounts by as much as $1 billion, and result in a percentage inflow estimate as low as 2 percent or as high as 6 percent.

Investment Responsibility

The term "investment responsibility" as used in this study, and officially by the Office of the Comptroller of the Currency, covers the following and similar trust capacities, unless relieved by the terms of the governing instrument, local law, or court order: trustee, executor, administrator, guardian of estates, committee of estates of lunatics, and managing agent. Investment responsibility does not necessarily imply complete or substantial discretion in the purchase and sale of specific assets.[5] Even in cases where investment is directed by others, the trustee may have investment responsibility. In this sense, the investment responsibility concept has more legal than economic significance, i.e., responsibility may entail a veto over certain types of investments, or potential liability for "illegal" investments.

Many trust departments have a substantial volume of investment management accounts. In these accounts, the trust department has physical possession of the financial assets, periodically reviews the assets, and makes investment recommendations; the principal must approve these recommendations. Trust departments do not have investment responsibility for investment management or advisory agency accounts, and they are not included in the figures in Table 1. However, from the standpoint of investment decisions and potential impact on financial markets, trust departments may exercise far more discretion in these accounts than in the case of some personal trusts whose investment decisions are determined primarily by external direction.

In the case of managing agency accounts, the principal confers power of attorney upon the trust department, so that the latter may effect investment transactions without prior approval by the principal. In many cases, managing agency accounts, as defined in Regulation 9, do not differ substantially from advisory agency accounts for, in the case of the latter, principals typically *do* follow the advice of the trust department. In the case of managing agency accounts, investment responsibility does exist for the trust department, and the assets of these accounts have been included in Table 1.

In some instances, bank trust departments perform an investment advisory function for accounts where they do not have physical possession of the assets. An example might be the case of a state pension or retirement fund where a bank trust department may act as *the* or one of several investment advisors. Or, a bank may utilize its trust and investment research facilities to advise an important customer on his investments, with or without an explicit fee. This type of in-

within the year, we are comparing a number of different 12-month periods and, in some instances, periods of more than or less than 12 months. Thus, any measure of stock price appreciation is necessarily a rough approximation. About 60 percent of trust assets were reviewed during the last three months of 1964, compared with about 57 percent in 1963. For both years, about 80 percent of trust assets were reviewed within the last six months. Thus, for the most part, we are dealing with a period averaging about 12 months in which we compare stock prices in the second half of 1963 with those of the second half of 1964.

[5] Of course, in many cases bank trustees do have complete or substantial discretion with respect to investment decisions. The American Bankers Association 1964 "Report of National Survey of Personal Trust Accounts" suggests that bank trust departments had "sole responsibility" for 42 percent of the assets in their personal trust coverage, whereas in the case of the remaining 58 percent of assets, they had either no investment responsibility or else shared it.

vestment advisory activity, while confined to a small number of bank trust departments, appears to be one of growing interest and may currently involve a considerable volume of assets. No effort has been made to include figures for this type of account anywhere in this study. By and large, such figures are not readily available and, even where they exist, they may involve considerable duplication.

Bank trust departments also perform a custodial function for individuals, mutual funds, nonprofit organizations, etc. In this capacity, they maintain physical possession of financial assets for safekeeping purposes, and may perform various services such as clipping coupons, crediting interest and dividend payments to deposit accounts, and maintaining tax records. The volume of assets involved in this type of capacity is extremely large. Assets of such accounts are not included in this study, for in such accounts trust departments do not exercise any investment discretion, nor do they possess investment responsibility in any legal sense. However, in practice, bank trust departments may actually provide some investment advice for accounts classified as safekeeping or custodial.

Table 2 lists the number of accounts and assets of various categories of employee benefit accounts where national banks acted as trustee. In addition to the accounts listed, national banks acted as agent for approximately 1,600 employee benefit accounts with assets of approximately $3 billion. In these accounts, some of them state and local government retirement plans, bank trust departments have physical possession of the assets and, to varying degrees, provide investment advisory service.

National banks reported 196 collective investment funds for pension and profit sharing accounts with assets of more than $1 billion. 87 of these funds were classified as equity, 90 as fixed income, and 19 as balanced funds. Approximately 44 percent of investments were in common stock, a somewhat lower percentage than for other employee benefit accounts administered by bank trust departments. Approximately five percent of the assets of employee benefit trusts administered by national banks were commingled. This is about the same percentage that appears to prevail for other trust assets where banks exercise investment responsibility.[6]

Table 2

Employee Benefit Accounts Held as Trustee by National Banks (Dollar Amounts in Millions)

Type of Account	Number of Accounts	Amount
Pension Plans	9,532	$15,292
Profit Sharing Plans	11,569	3,187
Stock Bonus Plans	46	62
Thrift Plans	267	1,698
Others	1,416	481
Not Classified*	——	112
Total†	22,784	20,782

* Includes Employee Benefit Trusts of late-reporting banks and of banks with trust assets of less than $5 million. The number of accounts was not available for these banks.

† Includes 388 accounts with assets of $3,740 million where investments were directed by others.

Table 3 indicates the distribution of trust assets among national banks according to their trust department size. 21 banks with investment responsibility for trust assets of more than $500 million held approximately 56 percent of the total, and the 100 largest trust departments held more than 80 percent of the trust assets of national banks. Asset concentration was greatest among employee benefit accounts for which the 21 largest national bank trust departments held

[6] Our estimate for other trust assets for *all* banks is $105.5 billion. At year-end 1964, common trust funds had assets of approximately $5.8 billion (Stanley Silverberg, "Growth and Performance of Common Trust Funds in 1964," *The National Banking Review*, 2, March 1964) or about 5.5 percent of the estimate for other trust assets. In some instances, employee benefit accounts may be invested in common trust funds, although the amount involved is probably relatively small.

Table 3

Trust Department Assets According to Trust Department Size (Dollar Amounts in Millions)

Trust Department Size	Number of Banks	Assets of Employee Benefit Accounts	Other Trust Assets	Total Trust Assets
Less than $10	1,127	$198	$2,039	$2,237
10 to 99.9	335	1,390	9,926	11,316
100 to 499.9	81	2,861	16,654	19,515
over 500	21	16,331	25,824	42,155
Total	1,564	20,780	54,443	75,223

Table 4

Assets of Investment Management Accounts for Selected National Banks (Dollar Amounts in Millions)

Trust Department Size	Number of Banks Sampled	Managing Agencies		Advisory Agencies		Total	
		Number of Accounts	Amount	Number of Accounts	Amount	Number of Accounts	Amount
Less than $100	7	10	$1	593	$273	603	$274
100-499.9	68	2,368	866	9,808	4,423	12,176	5,289
Over 500	20	2,203	916	10,035	8,084	12,238	9,000
Total	95	4,581	1,783	20,436	12,780	25,017	14,563

almost 80 percent of the assets where national banks acted as trustee. Large trust departments, for the most part, are concentrated in the largest commercial banks, although there are many exceptions where moderate-sized banks have very large trust operations, and vice versa.[7] The 21 largest national banks (with assets over $1 billion) held approximately 47 percent of national bank trust assets—pointing up the fact that the largest trust departments did not coincide completely with the largest banks.

National banks with trust assets in excess of $5 million reported having approximately 580,000 trust accounts, including 68,500 corporate accounts, and 340,000 accounts where they exercised investment responsibility. The average size of trust accounts where investment responsibility was exercised, excluding employee benefit accounts, was about $173,000. However, the average size of these accounts varied considerably with the size of trust departments. The average was $300,000 for banks having trust assets in excess of $500 million; $173,000 for trust departments with assets of $100-to-$500 million; $85,000 for departments with asset totals between $10 million and $100 million; and about $53,000 for trust departments with asset totals between $5 million and $10 million.

A number of trust departments, including most of the largest ones, were asked to supply data on the number and dollar amount of their investment management accounts. These data are summarized in Table 4. The sample covered 88 of the 102 national bank trust departments that

[7] See "Bank Trust Investments," *op. cit.* pp. 580-581.

had investment responsibility for at least $100 million in trust assets.

Investment management accounts tend to be larger than the average for other trust accounts, since many banks set a relatively high minimum size or minimum fee on such accounts. The average size of the accounts covered in Table 4 was $582,000, and it was $735,000 for trust departments in the largest size category, considerably higher than the comparable size averages for "other" trust accounts.

On the basis of data from the 95 trust departments reporting on agency accounts, we estimate that national bank trust departments held approximately $17.5 billion in investment management accounts at the end of 1964. Of this total, more than $15 billion would be in the "advisory agency" category, and thus are *not* included in the figures in Tables 1-3.

II. *Trust Assets of All Commercial Banks*

While the trust data collected by the Office of the Comptroller of the Currency have covered only national banks, several items of statistical information exist that enable us to convert national bank figures into reasonable estimates of trust assets for all commercial banks.

In the case of employee benefit accounts, there is a heavy concentration of assets in New York City banks[8] and, fortunately, the New York State Banking Department collects data on employee benefit accounts in which banks in New York State act as trustee. The latest available data indicate that banks in New York were trustee for $23.6 billion at the end of 1963. Taking account of asset appreciation arising from the 1964 increase in common stock prices, and estimated net inflow into new and existing accounts, we estimate that at the end of 1964, banks in New York were trustee for $26.9 billion in employee benefit accounts. Of this total, only about $3.4 billion was accounted for by national banks, leaving a figure of approximately $23.5 billion for state-chartered banks.

We estimate that state-chartered banks outside of New York are trustee for employee benefit accounts with assets of approximately $6 billion. This figure is based on a comparison of trust income for state and national banks in various states, national bank figures on employee benefit accounts, and a sampling of Federal Reserve trust examination reports for a number of state-chartered banks known to have large trust operations.[9] In total, we estimate that, at the end of 1964, commercial banks acted as trustee for employee benefit accounts with assets of approximately $50.3 billion, with national banks accounting for $20.8 billion and state-chartered banks for $29.5 billion. In addition, commercial banks acted as agents for employee benefit accounts with assets of at least $5 billion.

We estimate that state-chartered banks have investment responsibility for trust assets, apart from those of employee benefit accounts, of approximately $51 billion, bringing the total of such assets for all banks to approximately $105.5 billion. Our estimate for state-chartered banks is based upon data on trust income, data published in bank annual reports, personal conversations, and data found

[8] According to our estimates, and figures obtained from Federal Reserve trust examination reports, three banks in New York City account for more than one-third of the employee-benefit-account assets for which banks in the U.S. act as trustee.

[9] These reports included market value figures for employee benefit accounts at the time of the examination reports. These figures indicated that, for banks outside of New York, the appropriate estimate for state-chartered banks was below results obtained by merely relating national bank figures to the ratio of state-to-national trust income.

Table 5

Estimated Bank Trust Assets
(Dollar Amounts in Billions)

Type of Account	National Banks	State Banks	Total
Employee Benefit Accounts	$20.8	$29.5	$50.3
Other Investment Responsibility Accounts	54.5	51.0	105.5
Advisory Agencies	15.0*	20.0*	35.0*
Total	90.3	100.5	190.8

* Denotes minimum estimate.

in a number of Federal Reserve examination reports.[10]

State-chartered banks for which Trust Department Annual Reports were *not* available accounted for more than 51 percent of bank trust income in 1964.[11] However, about 52 percent of the trust income for state-chartered banks was accounted for by banks in New York State. The latter do a substantial amount of corporate trust and custodial business which adds significantly to trust income, but does not directly affect trust assets where investment responsibility is exercised. On the other hand, large New York City banks have large accounts where income may be a very low percentage of the market value of the assets.

On the basis of figures reported in trust examination reports, we estimate that state-chartered banks in New York had investment responsibility for "other trust assets" of about $23 billion at the end of 1964. This is a lower figure than would be obtained by projecting the national bank ratio of trust income-to-trust assets.

We estimate that state-chartered banks outside of New York had "other trust assets" of about $27.5 billion. This figure is approximately in line with the national bank ratio of trust income-to-other trust assets. However, our estimate does reflect an analysis of trust examination reports of the state-chartered banks known to have the largest trust departments.

Data on investment management accounts for state-chartered banks are less readily available than for accounts where investment responsibility is exercised. However, it is apparent that several banks in New York have a substantial volume of investment management accounts. In the case of some of these banks, the volume of investment management accounts apparently exceeds the value of "other trust accounts." For all state-chartered banks, we estimate that assets of investment management accounts, excluding the managing agencies with investment responsibility, exceed $20 billion.

Our estimates for state and national bank trust assets are summarized in Table 5.

[10] Examination report data on other trust assets tend to be less precise with respect to the separation of various trust capacities and the provision of current market valuations than is true of employee benefit accounts. Nevertheless, they do frequently provide reasonable estimates, or reasonable bases for estimating, "other trust assets" as defined in this article.

[11] See Appendix for 1964 bank trust income, by state, for national banks and all insured commercial banks. National bank trust income includes the full year's operation for Provident National Bank and Mercantile Trust Co., N.A., and the trust income for those nonnational banks that submitted 1964 Trust Department Annual Reports to the Office of the Comptroller of the Currency.

Table 6

Estimated Assets of Trust Departments Where Investment Responsibility Is Exercised—All Commercial Banks, Year-End 1964 (Dollar Amounts in Billions)

Assets	Employee Benefit Accounts	Other Trust Accounts	Total Trust Accounts
Cash	$.6	$1.1	$1.7
U.S. Government & Agency Securities	3.1	8.8	11.9
State, County, Municipal Securities	—	12.2	12.2
Other Bonds	17.6	4.9	22.5
Mortgages	1.6	1.6	3.2
Common Stock	25.7	67.3	93.0
Preferred Stock	.6	1.5	2.1
Other Assets	1.1	8.1	9.2
Total Assets	50.3	105.5	155.8

A year ago,[12] we estimated that the "other trust assets" with investment responsibility of state-chartered banks exceeded those of national banks by about six percent. That relationship would have been approximately maintained in 1964 if the national-bank coverage had not been expanded through conversions and the inclusion of some national bank affiliates. The 1963 estimate for "other trust assets" of all banks was $101.2 billion. That estimate apparently was too high because of the inclusion of advisory agency accounts by some banks in their reporting of assets where investment responsibility existed.

The American Bankers Association 1963 trust survey estimated the market value of personal trust accounts at $82.2 billion. Stock market appreciation would have raised their total to about $90 billion for the end of 1964. Their figures appear to be reasonably consistent with ours, considering the different trust account coverage.[13]

Table 6 presents estimates of the asset distribution of employee benefit trusts and other trust accounts where *all* banks exercise investment responsibility.[14] Based on these estimates, bank trust departments have investment responsibility for about 15 percent of the market value of corporate stock[15] (excluding intercorporate stockholdings). If we include investment management accounts, bank trust departments exercise some degree of investment responsibility for about 15 percent of the financial assets of individuals, including all private insurance and pension fund reserves.

[12] "Bank Trust Investments," *op. cit.*, pp. 583-585.

[13] Their figures exclude accounts where trust departments act as executor, administrator, and managing agent. In the trust capacities covered in both studies, the Comptroller's figures exclude accounts where investment responsibility "is relieved by the terms of the local law or court order."

[14] Asset distribution of employee benefit accounts is based upon 1963 estimates of noninsured pension fund assets by the Federal Reserve Board and the Securities Exchange Commission, and adjustment for 1964 investments and market price changes. Asset distribution for other trust accounts reflects the distribution of other trust assets for national banks after subtracting estimated employee benefit account assets. These figures were then modified to take account of different geographic and size distribution of trust assets for state-chartered banks.

[15] The New York Stock Exchange ("Institutions and the Stock Market, A Report to Institutional Investors," February 1965) estimates that bank trust departments may hold about 30 percent of the stock listed on the New York Stock Exchange. However, this estimate includes custodial accounts in addition to trusts and investment management accounts.

APPENDIX

Bank Trust Assets and Income by States

State	Accounts Where National Banks* Exercise Investment Responsibility				Trust Department Income in 1964		
	Number of Banks Having Accounts	Employee Benefit Accounts ($ Millions)	Other Trust Accounts ($ Millions)	Total Trust Accounts ($ Millions)	National† Banks ($ Thousands)	All Insured Commercial Banks ($ Thousands)	National Banks As a Percent of Total
United States	1,564	$20,782	$54,443	$75,225	$310,797	$640,071	48.6
Alabama	28	113	681	794	2,906	3,076	94.5
Alaska	4	2	4	6	72	72	100.0
Arizona	2	16	361	378	2,052	2,512	81.7
Arkansas	24	9	215	224	656	759	86.4
California	16	1,458	4,819	6,277	42,015	58,510	71.8
Colorado	25	100	936	1,036	5,200	5,485	94.8
Connecticut	13	205	1,402	1,607	6,917	15,647	44.2
Delaware	1	0	‡	‡	0	6,897	0
District of Columbia	6	173	969	1,142	5,927	5,927	100.0
Florida	62	153	1,754	1,907	8,573	10,515	81.5
Georgia	22	119	770	889	4,618	7,815	59.1
Idaho	1	6	22	28	239	284	84.2
Illinois	131	3,670	5,143	8,813	36,209	56,642	63.9
Indiana	93	220	1,518	1,739	6,090	8,088	75.3
Iowa	37	33	256	288	1,640	2,791	58.8
Kansas	35	28	272	299	1,260	1,375	91.6
Kentucky	52	23	237	261	1,455	5,388	27.0
Louisiana	18	55	169	224	1,247	1,524	81.8
Maine	15	15	180	195	1,078	1,910	56.4
Maryland	10	55	375	431	2,324	3,712	62.6
Massachusetts	60	1,802	3,867	5,670	22,109	33,226	66.5
Michigan	28	2,114	1,561	3,675	9,656	17,566	55.0
Minnesota	19	474	1,235	1,709	8,354	8,478	98.5
Mississippi	16	3	53	57	245	793	30.9
Missouri	26	520	1,661	2,181	8,054	10,549	76.3
Montana	10	2	38	40	156	452	34.5
Nebraska	13	48	373	421	2,246	2,283	98.4
Nevada	2	4	79	83	794	891	80.9
New Hampshire	20	5	124	130	445	515	86.4
New Jersey	85	112	989	1,101	8,416	15,090	55.8
New Mexico	12	5	99	104	670	698	96.0
New York	84	3,365	4,870	8,234	29,195	201,025	14.5
North Carolina	18	102	497	599	2,462	6,890	35.7
North Dakota	6	5	36	41	363	364	99.7
Ohio	50	867	2,809	3,677	12,084	26,748	45.2
Oklahoma	32	119	397	516	2,311	2,378	99.7
Oregon	2	62	521	582	3,499	3,668	95.6
Pennsylvania	156	3,357	7,411	10,768	32,405	58,591	55.3
Rhode Island	2	68	261	328	1,605	5,052	31.8
South Carolina	11	62	291	353	1,257	1,418	88.6
South Dakota	9	8	43	50	359	402	89.3
Tennessee	26	75	1,554	1,629	3,496	4,299	81.3
Texas	125	719	2,695	3,414	14,692	15,851	92.7
Utah	2	47	88	135	683	1,613	42.3
Vermont	12	3	37	41	210	532	39.5
Virginia	57	109	1,143	1,252	5,000	7,009	71.3
Washington	10	118	908	1,026	5,368	5,908	90.9
West Virginia	31	11	240	251	1,034	1,885	54.9
Wisconsin	33	143	447	590	2,902	6,678	43.5
Wyoming	12	1	33	34	189	200	94.5

* National bank figures on trust assets include national and nonnational banks in the District of Columbia and the assets of some affiliates of national banks that submitted data to the Office of the Comptroller of the Currency.

† National bank trust income covers the same banks as the asset figures, including full-year trust income for banks converting to national status in 1964.

‡ Less than $500,000.

► BURTON G. MALKIEL

The Strategy of Advance Refunding

Introduced in June of 1960, advance refunding was a major innovation in debt-management techniques. Two basic types of advance-refunding operations have been carried out by the United States Treasury: (1) "junior" advance refundings, which allowed holders of relatively short-term maturities to exchange them for intermediate maturities (i.e., around ten years); and (2) "senior" advance refundings, which gave holders of intermediate-term issues the option of exchanging their bonds for long-term issues. More recently, elements of both types have been combined. Holders of relatively short-term securities were offered the option of exchanging their holdings for intermediate-and long-term bonds. These operations we shall call "pre-refundings."

The Treasury has repeatedly affirmed that the senior transaction is the crucial operation in lengthening the average maturity of the debt at the least possible cost and, therefore, this paper concentrates on these senior refundings. We shall first recount the arguments advanced by the Treasury to explain the new technique's success during the early 1960's. Next, we will examine the implications of these arguments that pertain to the conditions necessary for the success of a senior advance-refunding operation. We shall attempt to demonstrate that senior-refunding offerings will be significantly more effective than other methods of debt-lengthening only under very special circumstances. Having established these circumstances, we shall then discuss the proper place of advance refunding in over-all, debt-management policy.

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I. *The Treasury Argument in Support of Advance Refunding*

It is reasonable for debt managers to tailor the techniques by which securities are issued to existing market preferences whenever, by accommodating these preferences, securities can be marketed at a lower cost. Whether such market behavior is rational or not, the Treasury is wholly rational in taking market reactions as they are, and adapting its sales techniques to them as long as other debt-management goals are not impeded. The Treasury's argument for the superiority of senior advance refunding over alternative methods of issuing longs rests on the recognition of two such market reactions: first, that a substantial proportion of current holders of intermediate-term governments feel "locked" into their current holdings by their reluctance to realize book losses; and, second, that the higher coupon that has been offered on the long issue is an important consideration in inducing the exchange of the lower-coupon, intermediate-term issue.

Explicit recognition of the locked-in argument is found in the following statement by Secretary Dillon:

> . . . When the Treasury puts out long-term securities for cash or in a regular refunding, we must appeal to investors who have complete freedom of action . . . However, in an advance refunding we are appealing to a group of investors who do not have complete freedom (of) action. To move out of their present holdings many of these investors would have to realize substantial capital losses on market sales. Through the advance refunding, these investors may extend the maturity of their holdings without putting capital losses on their books . . . *It is because of this special appeal of an advance refunding to those who otherwise would not wish to disurb their holding that the Treasury can in this way put out larger quantities of long-term bonds at lower interest costs to the taxpayer than would be possible by other means.* (Italics mine.) [1]

This locked-in effect is, in most cases, a sort of money illusion. The Treasury argument suggests that there will always be a proportion of holders of intermediate-term issues who would like to switch to longer, higher current-yield securities, but who are prevented from doing so by their unwillingness to realize paper capital losses. The locked-in argument is more plausible for the many institutional holders of governments who are either fully or partially tax exempt. The Treasury has argued that ". . . (these) institutions are usually quite reluctant to incur book losses because of the resulting decrease in the stated value of their assets." [2] However, advance-refunding transactions permit the holders of the

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[1] *Advance Refunding and Debt Management*, Hearings before the Committee on Finance, United States Senate, 87th Congress, 2nd session, March 14 and 16, 1962, pp. 7-8.

[2] *Debt Management and Advance Refunding*, Treasury Pamphlet, September 1960, p. 10n.

Indeed, some pension funds are actually prohibited by their bylaws from selling government securities at a loss. This is not to argue, however, that fully-taxable institutions and, in particular, commercial banks are reluctant to realize capital losses. It is one thing to argue that a commercial bank will not take a fully-deductible loss in order to loan to its valuable depositors, and quite another matter to assert that a tax-exempt institution may be reluctant to switch between marketable governments when the transaction would entail the realization of an embarrassing capital loss. It may even be that some fully-taxable investors feel locked in when Treasury bond prices rise above their purchase prices. In this case, tax-paying bond holders might be reluctant to sell intermediate issues because such sales would increase their tax liability. However, even if locked-in feelings of this type were prevalent, the Treasury should still be reluctant to capitalize on these preferences in refunding operations. To the extent that the Treasury is able to sell long-term bonds on more favorable terms only because it gives a special tax advantage to certain holders, it has not really achieved a *bona fide* gain.

original issue to avoid recognition of any gain or loss. "The advantage to such nontaxable investors is that they may be permitted to carry the new higher-rate securities at the same price as the old." [3]

This last quotation from the Treasury pamphlet states explicitly that higher-rate securities are to be exchanged for the old issues. This is, of course, the general presumption behind all of the senior transactions. Indeed, it is a key argument used by the Treasury to explain the attractiveness of the offer to the present holders. "Most importantly, the investor would obtain a better immediate (current) return on his security since the Treasury would offer a higher coupon to make the exchange attractive." [4] This may be interpreted as a Treasury view that some investors are rather irrational. For, given the yield to maturity of a bond, the height of the coupon is of rather minor importance. Nevertheless, assuming that present holders of intermediates are locked in, then institutions which may desire a larger current rate of return are, by assumption, precluded from realizing higher current income through sales of part of their holdings.[5]

[3] *Ibid.*

[4] *Ibid.*, p. 9.

[5] An additional argument often advanced to explain the success of advance refunding is that the Treasury has typically offered a "reinvestment rate" about 25 basis points higher than current market rates for long-term issues. The "reinvestment rate" is the yield that the holder of the intermediate-term issue would have to receive upon reinvestment at maturity in order to make him just as well off as he would be by accepting the Treasury's offer. (See Tilford C. Gaines, "Techniques of Treasury Financing," *Banking*, September 1964, p. 60.) The difficulty with this argument is that it does not explain why advance refunding should be superior to regular cash offerings. Were it not for the locked-in effect, holders could just as well switch their intermediates for longs at the time of a new offering for cash. The only advantage that would then remain for advance refunding is that the transactions cost of the sale of the intermediate-term issue would be avoided. This opportunity to economize on transactions costs, while not mentioned explicitly by the Treasury, has undoubtedly been of considerable importance in decisions to take advantage of advance refundings. Interviews with portfolio managers that were conducted by the author in conjunction with a study of the term structure of interest rates suggest that both the Treasury's arguments and the transactions-cost savings have been relevant in most decisions to subscribe to the advance-refunding offers.

II. *Implications of the Treasury View: The Mathematics of Advance Refunding*

Granting that the effectiveness of an advance refunding is influenced by these considerations of locked-in effects and coupon-inducement, I shall now argue that the advantage of the technique will tend to be greatest if two conditions are satisfied simultaneously: first, market interest rates must be relatively high compared to historical precedent; and, second, the bonds to be refunded must carry relatively low coupons. Low interest rates and high coupons on the bonds to be refunded militate against the refunding technique on two counts: they reduce or eliminate the unrealized capital losses (and, hence, the extent of the locked-in effect) on outstanding issues; and they limit the coupon inducement that can be offered to current security holders. Conversely, high current interest rates and low coupons on outstanding issues favor the use of the technique on both grounds.

The first part of the argument is easily established. If we assume that the extent of the locked-in effect varies directly with the magnitude of the unrealized capital losses on the securities held, then high interest rates and low coupons both serve to increase the degree of locking. Given its coupon, the current price of a bond will be lower and, hence, the capital loss greater, the higher is the market rate of interest. Given the market rate of interest (the yield to maturity), the price of

the bond will be lower the lower is its coupon.[6] Thus, to whatever extent the Treasury relies on the locked-in effect for the success of advance refunding, the effectiveness of the technique will depend on the existence of low coupons on outstanding bonds and high market rates of interest.

We have already noted that a senior advance refunding consists of an offer by the Treasury to exchange an intermediate for a long security. The exchange offer is made on a straight par-for-par basis or, perhaps, with a minor supplemental payment to adjust for differences in the market prices of the two issues. This latter feature makes advance refunding relatively attractive because of its ease of execution. Given these rules of the game, the Treasury does not have complete freedom of action in setting the coupon on the longer issue involved in the refunding operation. The price on the long issue is, in effect, set by the requirement that old issues should be exchangeable for the new at approximately the same market price.[7] The yield on the new securities is determined by the market's current yield pattern. But with both price and yield on the new securities largely out of the hands of the Treasury, the coupon on these bonds is also predetermined. The question is, then, under what circumstances will this predetermined coupon be attractive to investors?

[6] Of course, unrealized capital losses are actually a function of the difference between purchase price and current market price, not simply the current market price alone. To the extent that holders of long-term bonds are original purchasers (of a par offering), however, their capital losses measured from par will tend to be smaller the larger is the coupon. We shall assume throughout this paper that the security holders to whom we appeal are original purchasers of par offerings.

[7] In this analysis, we shall ignore the minor additional payments which sometimes must be made to the Treasury to take advantage of the offer and cases where the Treasury may make a payment to the holder to induce the exchange.

It turns out that precisely the same circumstances that tend to increase unrealized capital losses on intermediate securities tend to enlarge the coupon inducement that may be offered in an exchange for longer-term issues. Given the coupon on the shorter issue, the coupon that can be offered on the long bond (and hence the coupon inducement) is an increasing function of the market rate of interest on intermediate and long bonds.[8] Moreover, the coupon inducement that can be

[8] In demonstrating this assertion we use three assumptions, largely reflecting the rules of the game described above. First, we assume that the market yield to maturity for the intermediate issue and the long-term security are identical. This we may deem the typical case because the yield curve is usually fairly flat over the intermediate and long maturity ranges, irrespective of its shape in the early maturities. Second, we assume that no yield inducement is needed to bring about the exchange. Thus, the yield to maturity of the issue to be refunded and the longer security offered in exchange will remain identical after the exchange has been announced. Finally, we assume that both securities are selected so as to make the price of the outstanding bond identical with that of the new issue. Thus, the refunding we shall consider is a straight swap of bonds of different maturities selling at the same yield and price.

Let C_S be the coupon carried on the shorter (intermediate-term) issue and C_L be the coupon on the long bond offered in exchange. S and L stand for the maturity, in years, of the short and long bonds, and F is the face value of the bonds to be repaid at maturity. Using the standard expression for the price of a bond (P), we may write the condition that the market prices and yields (the i values) of the two securities be equal as follows:

$$\frac{C_S}{i} + \frac{F - C_S/i}{(1+i)^S} = P_S = P_L = \frac{C_L}{i} + \frac{F - C_L/i}{(1+i)^L}.$$

Solving for C_L we have:

$$C_L = C_S \frac{(1+i)^{L-S} - (1+i)^L}{1-(1+i)^L} + Fi\frac{1-(1+i)^{L-S}}{1-(1+i)^L}.$$

offered for any given level of interest rates varies inversely with the magnitude of the coupon on the short issue.[9] Thus, to the extent that considerations of lock-in and coupon inducement influence the effectiveness of advance refunding, the relative advantage of the technique will be greatest when market interest rates are high and coupons on outstanding intermediate-term bonds are low.

III. *An Illustration of Refunding Operations*

It will now be useful to describe an actual refunding, and then to offer some numerical examples of the findings just discussed. The February 1962 senior advance refunding is a good illustration. Three 2½ percent "tap" issues, maturing in about ten years, were made eligible for exchange into 3½ percent bonds maturing in either 28 years or 36½ years. The yield curve after ten years was relatively flat at the time. The level of long government rates was slightly above 4 percent. Using the 2½ percent bonds of (June 15) 1967-1972 as an example, we find that two weeks before the refunding was announced this issue sold at 86-14/32, to yield approximately 4.10 percent. The 3½'s of 1998 (eligible for exchange on a straight swap basis) sold at 88¾, and also yielded about 4.10 percent. (Note that the actual refunding differed from our hypothesized refunding in that the prices of the two issues were not the same.) Holders of the intermediate issue were offered an opportunity to exchange their bonds for a security whose pre-exchange market value was 2-10/32 points higher. Of course, after the refunding was announced, the two bonds sold at (approximately) the same price. Otherwise, arbitrageurs would have moved in to make a sure gain until the

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We now show that, given the coupon on the shorter issue, the coupon that can be offered on the long bond (and, hence, the coupon inducement) is an increasing function of i, the market rate of interest on intermediate and long bonds. Differentiating C_L with respect to i, simplifying, and collecting terms on C_S and F, we find that the sign of the derivative depends upon the sign of the expression:

$$C_S\,(1+i)^{L-S-1}\left[L\left(1-(1+i)^S\right)+S\left((1+i)^L-1\right)\right]+F\left[-i\,(1+i)^{L-S-1}\left[S\left((1+i)^L-1\right)-L\left((1+i)^S-1\right)\right]+\left((1+i)^L-1\right)\left((1+i)^{L-S}-1\right)\right]$$

It can be shown by numerical methods that this expression is positive for all values of the parameters as long as $.10>i>0$, $L>S$, and the short bond is of intermediate (circa 10 years) maturity. Thus, the coupon inducement generally varies directly with the height of market interest rates.

One modification to this result should be noted. To the extent that the yield curve has a non-zero slope in the over-10-year range, this slope is likely to be inversely related to the level of interest rates. Thus, if, in a period of very low interest rates, the yield curve had a large positive slope in the long end, the capital-loss inducement to advance refunding might be small without a corresponding reduction in the possibility of coupon sweetening. Similarly, to the extent that a slight yield inducement is offered, the size of the coupon inducement will be somewhat larger than this analysis suggests.

[9] Utilizing the assumptions of note 8, and differentiating the coupon inducement with respect to C_S, we have:

$$\frac{\partial\,(C_L \quad C_S)}{\partial\,C_S}=\frac{(1+i)^{L-S}-(1+i)^L}{1-(1+i)^L}-1.$$

This can be rewritten as:

$$\frac{1-\dfrac{1}{(1+i)^S}}{1-\dfrac{1}{(1+i)^L}}-1<0$$

for $i>0$ and $L>S$.

Thus, the lower is the coupon on outstanding issues, the greater is the coupon inducement that can be offered.

prices were driven to equality.[10] Nevertheless, an added bonus still remained for those investors who accepted the exchange, even though the market prices of the two issues were essentially identical. This was because, at equal prices, the yield to maturity of the two issues was different. On February 20, 1962 (the day after the exchange offer was announced) both bonds sold at approximately 87¼, but the intermediate 2½'s yielded 4.02 percent while the 3½'s yielded 4.18 percent. We see, then, that a 16-basis-point spread in yield (to maturity) was offered in addition to the 1 percent higher coupon in order to induce the exchange.[11]

Using the February 1962 refunding as an archetype, we now illustrate by numerical example how a refunding of this type could be carried out at different interest-rate levels and with different coupons on the 10-year issue. These calculations differ from our mathematical demonstration since we will assume that approximately a 25-basis-point yield inducement is always offered to holders who accept the exchange. Part One of Table 1 shows how large a coupon inducement can be offered under different assumptions as to the level of long-term rates, assuming that the intermediate issue carries a 2½ percent coupon.

To illustrate how the calculations were performed, we shall explain the derivation of the first two lines of Table 1. We assume that the approximate level of long rates is 4½ percent. We arbitrarily assume that the intermediate (10-year) issue sells at 10 basis points below the general level, and that the long (35-year) issue offered in exchange (at about a 25-basis-point yield inducement) sells at approximately 15 basis points above 4½ percent. Assuming that the 10-year issue yields 4.40 percent with a 2½ percent coupon, we can solve for the price, which is $84.76 per $100 face value. Using this price, we solve for the coupon to be carried by a 35-year issue that yields about 4.65 percent.[12] Solution of this equation yields a coupon of 3¾ percent. Thus, at a 4½ percent level of rates, a 1¼ percent coupon inducement can be offered. But note that the lower is the level of long rates, the less conducive is the situation to the advance-refunding technique. Indeed, if the level of rates falls to 2 percent, a *smaller* long-term coupon must be offered if no more than a 25-basis-point yield inducement is to be offered. Moreover, we observe that as the level of long rates *falls*, the price of the 10-year issue rises, thus "unlocking" more and more holders who had originally purchased the issue at higher prices. Thus, on both counts, lock in and coupon inducement, high interest rates provide the most favorable milieu for the advance-refunding technique.

Part Two of Table 1 examines the effect of higher coupons existing on the intermediate issues outstanding, assuming the level of rates is 4 percent. It shows clearly that the higher the coupon of the bonds to be exchanged, the smaller the coupon inducement that can be offered with a fixed basis-point differential, and the smaller the potential capital losses for any given level of interest rates. Thus, accepting the Treasury's view of the conditions that make advance refunding advantageous, we must conclude that the technique will be most effective when market interest rates are high relative to historical precedent, and when coupons

[10] Actually, the prices of the two issues remained about 4/32nds of a point apart. The difference is a reflection of the fact that arbitrage in this case was not entirely costless.

[11] A basis point equals 0.01 percent.

[12] Since the coupons carried by government bonds are generally not perfectly divisible, we have chosen to let the yield inducement vary slightly from 25 basis points in order to allow the resulting coupons to be in multiples of 1/8 of one percent.

Table 1

Part One
Refundings of 2½% Coupon Bonds

Bond	Coupon	Maturity in Years	Price	Percent Yield to Maturity	Approximate Level of Long Rates
Bond eligible for exchange	2½	10	84.76	4.40	4½%
Bond offered in exchange	3¾	35	84.76	4.63	
Bond eligible for exchange	2½	10	88.50	3.90	4%
Bond offered in exchange	3½	35	88.50	4.12	
Bond eligible for exchange	2½	10	96.55	2.90	3%
Bond offered in exchange	3	35	96.55	3.16	
Bond eligible for exchange	2½	10	100.00	2.50	2⅝%
Bond offered in exchange	2¾	35	100.00	2.75	
Bond eligible for exchange	2½	10	105.44	1.90	2%
Bond offered in exchange	2⅜	35	105.44	2.15	

Part Two
Refundings of 3% and 3½% Coupon Bonds

Bond	Coupon	Maturity in Years	Price	Percent Yield to Maturity	Approximate Level of Long Rates
Bond eligible for exchange	3	10	92.61	3.90	4%
Bond offered in exchange	3¾	35	92.61	4.15	
Bond eligible for exchange	3½	10	96.71	3.90	4%
Bond offered in exchange	4	35	96.71	4.18	

on existing bonds are low. The alleged success of the operations during the early 1960's depended upon very special circumstances: the simultaneous existence of a large body of low-coupon intermediate issues (the heritage of extensive wartime financing at pegged rates), and a level of interest rates that fluctuated near their highest level of the past 40 years.

IV. *Senior Advance Refunding Compared to Alternative Techniques of Marketing Long-Term Bonds.*

We have seen that the Treasury's basic argument for advance refunding is that, granting the desirability of debt lengthening, such lengthening can be accom-

plished at lower cost to the government if alternative techniques of selling longs are employed. Extending the Treasury's argument, we have shown that the relative advantage of advance refunding is likely to be greatest when interest rates are high in comparison with past experience, and when the coupons on outstanding bonds are low. An acceptable test of these arguments must ultimately rest on empirical evidence. Specifically, there is required a direct comparison under various alternative circumstances between the cost of advance refunding and other methods of debt lengthening.

Reformulating the arguments of the preceding sections into specific hypotheses, we suggest that: (1) senior advance refunding enables the Treasury to accomplish a given amount of debt lengthening at a lower cost than regular cash offerings; and (2) advance refunding of low-coupon, intermediate-term bonds at relatively high interest rates is less costly than the refunding of high-coupon intermediates at relatively low interest rates. Unfortunately, there is no experience with advance refunding under different market conditions that can be used to test hypothesis two. Since 1960, when the technique was introduced, the level of long-term interest rates has remained at relatively high levels. Moreover, refundings have never been tried with high-coupon intermediate securities. Nevertheless, we do have some experience with pre-refunding operations which, at least in some respects, simulate some important elements of a hypothetical advance refunding with low interest rates and high-coupon intermediates. Specifically, since the security to be exchanged in a pre-refunding is relatively short, its price cannot be far from par, thus precluding a significant locked-in effect. Moreover, the coupons on the issues to be exchanged have been much higher than those issues exchanged in senior refundings, thus diminishing the amount of coupon inducement offered.[13] Consequently, on both counts we would expect senior advance refundings to be less costly to the Treasury. By comparing senior refundings with pre-refunding operations, we can, therefore, conduct a very crude test of the second hypothesis. The first hypothesis may be tested by comparing advance refundings with sales of new securities for cash.[14]

It should be noted at the outset that we shall attempt to measure only one element of cost—the yield inducement relative to comparable outstanding securities which was necessary to market the new issue.[15] As is well known, the

[13] In addition, according to the Treasury argument, many of the original holders (who are alleged to prefer long-term bonds) are no longer owners of the security.

[14] We would also have liked to compare senior advance refundings with regular refundings. In order to obtain a comparable number of observations for regular refundings, however, it would have been necessary to go back to a period when the level of interest rates and other market conditions were significantly different from those which characterized the period covered by Table 2. It was felt, therefore, that such a comparison would have been misleading.

[15] Thus, we are not treating the argument advanced by the Treasury that advance refundings involve less reduction in the current flow of long-term funds to the private sector. This argument is far from self-evident, and can probably be analyzed properly only by a detailed micro-economic study of institutional portfolio behavior. Such a study is beyond the scope of this paper.

Another advantage of advance refunding is that it permits debt lengthening to proceed independently of the refunding of maturing issues. Indeed, it could be argued that an important measure of the success of the technique over the past five years is that it permitted *both* a lengthening of the average maturity of the debt and a sizeable increase in the volume of securities maturing in under one year. Thus, lengthening could proceed at the same time that short rates were nudged up to help cope with the balance-of-payments situation. Whether or not advance refundings were actually successful in accomplishing this objective with a minimal effect on long rates can be judged, in part, by the yield spreads presented below.

yields at which new issues are sold (new-issue yields) are generally higher than the yields of already-distributed ("seasoned") securities—the difference reflecting the cost involved in marketing a large volume of new securities at a single time. Such a premium over market yields may be considered to be the most important component of the transactions costs incurred by the issue of new securities. In the case of advance refundings, additional offerings of already-outstanding securities are often undertaken—no specific "new" issue (with separate maturity and terms) need be created. Nevertheless, the market yields of the reopened securities as of the date the refunding offer is made may be considered to be the new-issue yields, since these are actually the yields that induce the exchange. Indeed, the minimal effect on market yields is one of the main alleged advantages of advanced refunding. Thus, utilization of data on yield spreads as a measure of transactions costs would appear to be a reasonable way to proceed in testing our hypotheses.

The relevant yield premium might be measured by at least two different methods. The first simply compares the yield on the date of issue of the security offered in the exchange with the yield on comparable debt securities in the same maturity.[16] This measure indicates the premium over prevailing long-term market yields necessary to induce the exchange or cash sale. A second measure calculates the premium over the pre-announcement yields of outstanding securities of the same maturity.[17] Since post-announcement yields of comparable securities will themselves be influenced by the Treasury operation, this measure may better indicate the "true" premium paid by the Treasury.

Such yield spreads should not be used without adjustment in comparing advance refundings with alternative methods of debt lengthening. It is not fair, for example, to compare a senior refunding where 10-year bonds are exchanged for 30-year issues directly with a cash offering where 30-year bonds are sold outright. A one-dollar cash offering produces more lengthening than the hypothesized advance refunding.[18] We shall, therefore, introduce the concept of funding cost per unit (year) of lengthening: the yield spread divided by the number of years of lengthening accomplished. Thus, if the yield spread was 20 basis points per bond for the advance refunding hypothesized above, and 30 basis points for the cash offering, we would conclude that both offerings cost the Treasury one basis point per (bond) year of lengthening.[19] Table 2 presents yield-spread and volume data for the Treas-

[16] The date of issue was taken to be the last day on which holders of the intermediate securities could tender their bonds for exchange. When more than one (long) issue was offered, the average yield was calculated in computing yield spreads. Since tax implications are quite different for issues with dissimilar coupons, care was taken to insure that comparable issues of the same maturity carried similar coupons.

[17] Pre-announcement yields were recorded two weeks prior to the actual announcement of the issue. Choice of a two-week period represented a compromise. A date too close to the announcement might have been unsatisfactory if the Treasury's plans had been guessed correctly by the market and had therefore been discounted in the market prices. A date too far from the announcement, on the other hand, could have been misleading since yield spreads might reflect only general market movements rather than simply the Treasury debt-management operations.

[18] Abstracting from budget deficits and surpluses, we may consider an outright sale of longs as a swap of new bonds for maturing bills.

[19] We are implicitly assuming that the Treasury obtains the same amount of lengthening from an advance refunding of 10-year into 30-year bonds as from a new cash offering of 20-year issues. Such an assumption can be criticized on the ground that the ad-

Table 2

Costs of Marketing Long-Term Bonds
Measured by Yield Inducements Offered Relative to Comparable Outstanding Securities

Type of Offering	Date	1 Number of Years of Lengthening Accomplished	2 Spread From Date-of-Issue Yields of Securities of Same Maturity		3 Spread from Pre-Announcement Yields of Securities of Same Maturity		4 Volume of New Longs Issued	5 Level of Long Term Government Rates
		Number of Years	A Basis Points	B Basis Points Per Year of Lengthening	A Basis Points	B Basis Points Per Year of Lengthening	Millions of Dollars of Par Value	Percent
Senior Advance Refundings	September 1960	25	13	.52	11	.44	3980	3.82
	September 1961	19	5	.26	10	.53	3757	4.02
	February 1962	22	7	.32	7	.32	1832	4.09
	Mean	22	8⅓	.37	9⅓	.43	3190	3.98
Pre-refundings	February 1963	15	14	.93	16	1.07	1008	3.92
	September 1963	29	12	.41	18	.62	1260	4.04
	January 1964	27	7	.26	7	.26	748	4.15
	July 1964	20	9	.45	11	.55	1194	4.13
	Mean	22¾	10½	.51	13	.63	1053	4.06
Cash Offerings	June 1958	27	12	.44	14	.52	1135	3.19
	January 1959	21	14	.67	21	1.00	884	3.90
	April 1960	25	10	.40	16	.64	370	4.17
	August 1962	30	13	.43	17	.57	360	3.97
	Mean	25¾	12¼	.49	17	.68	687	3.81
Cash Offerings by Competitive Bidding	January 1963	30	7	.23	4	.13	250	3.88
	April 1963	31	5	.16	8	.26	300	3.97
	Mean	30½	6	.20	6	.20	275	3.93

ury's recent marketing operations in the long-term market. In addition, the number of years of lengthening accomplished by each offering is presented, and all yield premia are converted into costs per year of lengthening. Finally, the table shows the level of long-term-government rates during the months in which the offerings were made.

vance refunding probably produces less effective lengthening, inasmuch as the bondholders who exchange their securities were, allegedly, locked into long bonds in the first place. Thus, our results may be slightly biased in favor of the advance-refunding technique. It might also be argued, on market-segmentation grounds, that shifting debt from the 10-year to the 30-year portion of the maturity spectrum (i.e. within the long-term market) is bound to have a smaller effect on 30-year yields than an operation which moves debt from the short-term maturity range (or cash) into the capital market. We should note, however, that senior refunding operations were typically carried out in conjunction with junior advance refundings. Thus, debt was actually shifted from short to long maturities, and any smaller effects on long yields cannot be explained by a theory of market segmentation.

Great caution must be exercised in interpreting these data. We have very few observations and, consequently, the small differences in cost we find are, in most cases, not statistically significant. Such yield-spread data cannot establish that one method of selling long-term bonds would have been preferable to others at any point in time. Nevertheless, these somewhat crude comparisons represent the only available empirical evidence bearing on our hypotheses. They do appear to be sufficiently interesting to report, and at least permit some very preliminary appraisal of recent innovations in debt-management techniques.

Our first hypothesis suggested that a given amount of debt lengthening can be achieved at lower cost by senior advance refundings than through regular cash offerings. Comparing the average costs (yield spreads) expressed in terms of a unit of lengthening (columns 2B and 3B of Table 2) for both types of offering, we find that senior refundings have been about one-third less costly than regular

offerings.[20] The implication of this finding receives confirmation from the observation (column 4) that during the average advance refunding over three times as many long bonds were sold than during regular cash offerings. To the extent that the Treasury incurs other (partially-fixed) costs in any financing operation, the large volume of securities sold enhances the attractiveness of the advance-refunding technique.[21] Moreover, we note in column 5 that interest-rate levels were within a few basis points of each other during the months when both types of offerings were carried out.[22] Therefore, we suggest that there is some support for the Treasury view affirming the superiority of senior advance refunding under the conditions which prevailed when it was carried out.

Our second hypothesis was that advance refundings of low-coupon intermediates at high interest rates would be more effective than the same operation with high-coupon intermediates at low interest rates. We suggested above that a crude test of this hypothesis would be to observe whether senior advance refundings have been less costly than pre-refundings. What evidence there is indicates that senior advance refundings have been substantially less costly than pre-refunding operations (but the difference was again not statistically significant, as indicated in Table 3). Much larger quantities of longs were put out under senior advance refundings at a much lower funding cost. Our data indicate that the adjusted yield spreads for pre-refundings have been little less than those for cash offerings. This finding can be interpreted to imply that senior refundings would have been significantly less effective had the level of interest rates been lower, and the coupons higher, on the bonds to be refunded, as we argued previously. Indeed, it is doubtful if senior refundings under such circumstances would have an absolute advantage over regular cash offerings.

Perhaps the most interesting (albeit an incidental) observation from these data concerns a comparison of regular cash offerings and sales through competitive bidding. We find in Tables 2 and 3 that the funding cost incurred in the sale of longs by competitive bidding was substantially and significantly lower than that of regular offerings. Nevertheless, even here we must be cautious in interpreting the results. The two issues sold by competitive bidding were very small, and the yield spread undoubtedly would have been greater for a larger volume of new issues. In addition, the novelty of the technique, and the element of pride involved in being the underwriter of the first government bonds sold by this type of competitive bidding, undoubtedly contributed heavily to the success of the first issue. Moreover, the second issue sold by competitive bidding was quite unsuccessful from the viewpoint of the underwriters. It is estimated that one-half of the issue remained unsold for over two weeks. These bonds were subsequently sold when the bidding syndicate was dissolved, but only at a discount from the original offering price. Despite this,

[20] While the results are consistent with my hypothesis, they are not sufficiently strong to allow me to reject the null hypothesis. See Table 3 for test results.

[21] In addition, recent evidence demonstrates that yield spreads are positively related to the volume of new issues. (See Joseph W. Conard, "The Behavior and Determinants of Interest Rates: A Progress Report," in *The National Bureau in its Forty-Fifth year*, New York, June 1964, pp. 37-38.) This suggests that the above comparison would have been even more favorable to advance refunding if a commensurate volume of new issues had been sold.

[22] Only during the June 1958 cash offering were interest rates markedly lower. But, since it is considered easier to sell long-term bonds during periods of "easy" money, this would suggest that the relative effectiveness of advance refunding was even greater than our yield spread data indicate.

Table 3

Test Results: t Values for Tests of Significance of the Difference Between Means

Basis of Comparison	Senior Advance Refundings vs. Regular Cash Offerings	Senior Advance Refundings vs. Pre-refundings	Competitive Bidding vs. Regular Cash Offerings
Yield Spreads per unit of lengthening From Date-of-Issue	1.23	.76	3.04*
Yield Spreads per unit of lengthening From Pre-Announcement date	1.81	.98	2.89*

* Significant at the 0.05 level

the evidence would still seem to support a more sanguine view of the technique than that which predominates, at least in the financial community.

V. Concluding Comments

We have suggested that advance refunding has been a useful debt-management tool in enabling the Treasury to sell long-term bonds on very favorable terms. However, our theoretical and empirical analysis suggests that the technique is significantly more effective than alternative methods of debt lengthening only when interest rates are relatively high and, in particular, when they have risen substantially above the original offering yields (coupons) of existing issues. Thus, very special circumstances help explain the success of the technique during the early 1960's. It is precisely this factor that suggests a possible danger in the technique. The relative effectiveness of advance refunding will tend to be greatest when funding is not appropriate from the standpoint of interest-cost minimization. If the Treasury were to rely on a method for selling longs that is advantageous only when interest rates are high relative to historical precedent, then the bulk of debt lengthening would tend to be concentrated during periods of high interest rates. Thus, any transactions-cost savings would be vitiated by the added interest costs incurred. Realization of this potential conflict between goals must be understood in order to insure that a serviceable technique is not misused.[23]

The use of advance refunding raises another possible conflict between debt-management objectives. Accepting the Treasury's (questionable) view that advance refunding minimizes the reduction in the flow of long-term funds to the private sector, it is possible to fashion a countercyclical role for the technique. Lengthening would go on throughout the

[23] In practice, it may be misleading to separate the decision to lengthen from the lengthening instruments available. To put the matter another way, I would question whether advance refunding has been used only to accomplish that degree of lengthening which otherwise seemed desirable, or whether the Treasury had not chosen to do significantly more lengthening simply because advance refunding was such a convenient technique. It is true that, to the extent the Treasury has developed a better technique to sell long bonds, the optimum structure of the debt should include more long-term issues. Nevertheless, I suspect that, in fact, the tail may have been allowed to wag the dog. Indeed, both the Treasury and Federal Reserve have boasted that one of the advantages of advance refunding is that it enables the Treasury to sell more long-term bonds than would otherwise be possible. Consider, for example, the following statement: "Through the device of advance refunding the Treasury has marketed more long-term securities than would have been deemed practicable had it relied solely on traditional financing methods." See Ernest Block and Joseph Scherer, "Advance Refunding: A Technique of Debt Management," *Monthly Review*, Federal Reserve Bank of New York, December 1962, p. 174.

cycle, with cash sales utilized during sustained boom times (to divert long-term funds from private investment), and with advance refunding used during periods of recession and early recovery (so that lengthening be rendered as little restrictive as possible). In this case, countercyclical debt management would not involve the timing of long-term issues, but rather only the techniques by which they are issued. But, since we have shown that it is only during the boom (when interest rates are high) that advance refunding appears to be markedly superior to regular cash refundings, we are forced to conclude that advance refunding cannot be generally relied upon as an effective countercyclical debt-management tool, even if we accept the Treasury's argument concerning the "drain" of long-term funds.[24]

An incidental result of our empirical analysis should be emphasized. We found that cash offerings by competitive bidding were by far the least costly method of issuing longs during the period reviewed. It is true that there were several reasons to doubt that significant quantities of longs could have been sold at the small costs involved in the first two experimental offerings. Nevertheless, there should be a great deal more experience with competitive bidding before dismissing this technique from further consideration.[25] Auctioning of long-term bonds, rather than advance refunding, may yet turn out to be the more significant innovation in debt-management techniques.

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[24] R. A. Musgrave has pointed out to me that a case can be made for advance refunding as a useful countercyclical tool, at least during the early 1960's. Since interest rates were relatively high during the recession and early recovery period, the technique could be usefully employed. Again, we see, however, how the special circumstances of the early 1960's (in this case the international constraints against "active" easy-money policies) favored the use of the technique. For had interest rates not remained extremely high relative to the 2½ percent nominal yield on outstanding bonds, the technique could not have been effectively used.

[25] A similar view has recently been offered by Robert E. Berney, who also analyzes several ancillary arguments for and against the technique. He concludes that auctioning "should be considered a useful technique in managing the public debt." See Robert E. Berney, "The Auction of Long-Term Government Securities," *The Journal of Finance*, September 1964, p. 482.

► GEORGE J. BENSTON

Economies of Scale and Marginal Costs in Banking Operations

I. *Purpose of the Study*

Banking is one of the largest, most vital, and most highly-regulated industries in the United States. Yet, little is known in detail about its cost structure.[1] Marginal-cost information would enable banks to operate more efficiently in mak-

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The Federal Reserve Banks did not dictate how the data should be used or the conclusions that should be reached. The author alone is responsible for any mistakes of judgment or mechanics.

[1] To my knowledge, only eight studies covering these problems have been published. Those marked by asterisks are contrasted with the present study in Section XII below. The studies referred to are the following:

J. C. Gibson, *Report on Bank Cost Study*, Madison: University of Wisconsin, School of Commerce, Bureau of Business Research and Service, 1947.

Bank Management Commission, and Country Bank Operations Commission, American Bankers Association, *Trends in Bank Costs*, 1956 Edition, New York: American Bankers Association, 1956.

*David A. Alhadeff, *Monopoly and Competition in Banking*, Berkeley: University of California Press, 1954, Chapter VI.

Joseph Ascheim, "Commercial Banks and Financial Intermediaries: Fallacies and Policy Implications," *The Journal of Political Economy*, LV, 1959, pp. 59-71.

Deane Carson, "Bank Earnings and the Competition for Savings Deposits," *The Journal of Political Economy*, LV, 1959, pp. 580-588.

*Lyle E. Gramley, *A Study of Scale Economies in Banking*, Research Department, Federal Reserve Bank of Kansas City, 1962.

ing loans and processing deposit accounts. Knowledge of economies-of-scale would enable economists to answer questions about monopoly and competition in banking, and to analyze bankers' behavior with respect to time deposits, mortgage loans, and other banking services. The banking industry also provides the economist with an excellent subject for the study of long-run cost curves. The output of banks is generally limited by institutional conditions, so that observations on a cross-section of banks may trace a long-run cost curve. And the outputs and costs of banks are sufficiently homogeneous for useful statistical analysis.

This study is based on cost data gathered by the Federal Reserve Bank of Boston, covering a group of small and middle-sized New England banks.[2] From these data, *direct* costs of demand deposits, time deposits, mortgage loans, instalment loans, business loans, and securities—and *indirect* costs of administration, business promotions, and occupancy expense—were analyzed individually for cross-sections of 83, 82, and 80 banks for the years 1959, 1960, and 1961, respectively. Two related questions were considered: (1) to what extent are there economies or diseconomies of scale-of-cost with respect to units of output in banking operations; and (2) what are the marginal costs of specific variables that measure output? Since the samples used in this study were not randomly selected, were limited to banks under $55 million in assets, and did not include estimates of the cost-of-risk, or the opportunity costs of invested capital or alternative fund uses, the results cannot be considered representative of the banking industry as a whole. However, over 52 percent of the banks in the United States during this period were within the size range of the banks studied. More significantly, the data provide us with precise estimates of the elasticities and marginal cost of the output variable upon which cost depends.

The following section presents the variables upon which costs are thought to depend, the reasons for their choice, and the method of measurement used. Next, the nature of the data utilized and the computational procedures followed are described. The specific findings applicable to individual banking services are presented in sections IV through XI. A summary of the findings of the present study, and a comparison with those of previous studies, follows in section XII. The relationship of this study to the problems of cost studies in general is considered in the final section.

II. *Variables on Which Costs Depend*

The direct and indirect costs of banking operations were analyzed in accordance with the general form of the cost function, where operating cost = f (output mix; quantity of output; quality of output; growth and variability of output; factor prices; form of organization; merger; technology; random factors). The variables chosen to represent each of these factors were the following:

1. *Output mix* is usually a serious problem for cost studies, since the presence of joint costs makes it difficult to estimate the cost of specific outputs. A common procedure is to develop a single index of output. For example, the studies of banking costs cited with asterisks in footnote 1, of page 000 use "total assets"

*Paul M. Horvitz, "Economies of Scale in Banking," in *Private Financial Institutions*, Commission on Money and Credit, Englewood Cliffs, N.J.: Prentice-Hall, 1963.

*Irving Schweiger and John McGee, "Chicago Banking," *The Journal of Business*, XXXIV, 1961, pp. 325-328.

[2] The Federal Reserve Bank of New York pioneered in making these studies. To my knowledge, the data gathered by the New York Bank have not been used for economic analysis.

and "loans and investments" as measures of output. A problem with these indexes, aside from the difficulty of justifying them as valid or accurate measures of output, is the fact that bankers and economists require more detailed data for decision-making.

In this study, costs were allocated to several homogeneous banking services and each was analyzed separately. In effect, each bank was divided into six separate units—"producing" demand deposits, time deposits, mortgage loans, instalment loans, business loans, or securities. The output for each of these services can be measured with a limited number of output and other explanatory variables, a procedure which, in general, eliminates the need for special indexes and reduces the problem of collinearity. The problem of joint costs was reduced by two procedures: (1) indirect costs were analyzed separately; and (2) the cost effect of possible interrelations among banking services was estimated by including a measure of overall activity such as "total assets",[3] or a measure of specific activity where there was reason to believe that a specific interrelationship was present.

2. Identification of the *output* of banks has been a problem because it is difficult to define the "product" produced by banks.[4] The division of banks into the several, relatively homogeneous, service functions described above is effective in narrowing the output-identification problem to two aspects: (1) the dollar amount of loans and investments made; and (2) the number of deposit accounts and loans processed.

Most studies have followed Alhadeff's lead and defined output as the *dollar amount* of loans and investments made.[5] For many problems of economic analysis, it is useful to think of the amount of loans and investments as the product sold, the amount of deposits as the factor of production, and the amount of operations expenses as the cost of production. However, a better measure of bank output for a study of the costs of banking operations is the *number* of deposit accounts and loans processed.

The "work" of a bank consists of transferring funds on demand, holding and investing funds for time depositors, and making loans and investments. The operations costs incurred are a function of the services performed.[6] Since these services are related primarily to the *number* of deposit accounts and loans processed rather than the dollars loaned, economies-of-scale should be measured against this concept of output. If the dollars of deposits and loans were the measure used, there would be the danger that economies-of-scale due to processing larger accounts and larger loans would be confused with economies due to more efficient operations.

The number of deposit accounts and loans also provides a useful measure of output for marginal-cost computations. If these computations are to be useful to the banker, marginal cost must be estimated for variables over which the banker can exercise control. A general index of output, such as total loans and investments, is too broadly defined for this purpose.

[3] "Total assets" was chosen to represent overall activity because it was the most convenient variable capable of serving as a proxy for general banking operations. It is assumed that any cost advantages or disadvantages of producing banking service of a given size within larger organizations will be measured by the variable "total assets".

[4] I am indebted to Professor Alhadeff for his criticism of an earlier draft of this paper. He showed me the necessity of defining clearly the output against which economies-of-scale were measured. Of course, he is not responsible for the definitions presented here.

[5] Alhadeff, *op. cit.*, Horvitz, *op. cit.*

[6] The validity of this assertion was demonstrated by the present study, in which the number of deposit accounts or loans was found to be far superior to other variables for explaining the variance of operations costs.

Therefore, output was defined as the number of deposit accounts and loans processed. The variable used was the arithmetic mean of the number outstanding at the end of each month during a year.[7] Obviously, this average is likely to be more closely related to operations-costs for the year than is the number outstanding on any single day.

The average balance of deposit accounts and loans was also used in each of the regressions as an explanatory variable, because many operations-costs are related to the amount a customer deposits or borrows. This variable is the quotient of the sum for the year of deposits or loans at the end of each month, divided by the sum for the year of the number of accounts or loans at each month-end.[8]

In addition, several other explanatory variables were used for individual banking services when the analysis made of the service indicated that these variables would measure operations costs not caused by the volume of output or other factors otherwise accounted for. For example, the number of checks, deposits, and transit items processed per account was included in the demand deposit regression to account for cost differences (if any) among banks due to differences in account activity.

The number of deposit accounts and loans was not used as the measure of output for indirect costs. An index of the numbers would have had to be constructed and there did not appear to be any satisfactory way to choose weights for the different banking services. Additionally, indirect costs, such as business promotion, are more closely related to dollars than to accounts and loans processed. Therefore, "total assets" was used as the output variable for indirect costs. Alternately, "total loans and investments" could have been used, but there would have been no difference in the results, since these two measures of overall activities are correlated at over + .99.

3. *Quality of output* is assumed to be the same for all banks. For example, most mortgage loans carry similar provisions, and checking accounts are treated comparably by most banks. Of course, there are differences in the services provided to customers in different banks. To a large extent, however, these differences were controlled by segregating costs of individual banking services, and by including in the regressions any independent variables that might account for suspected differences. It was assumed that the differences that remained were distributed randomly with respect to banks and the independent variables.

4. *The growth and variability of output* over time may affect the cost incurred in a given year. For example, a bank whose deposits are growing or shrinking rapidly may have higher current costs because of its temporary inability to adjust fully to a given level of output. (In effect, such a bank is on a shorter-run marginal cost curve than banks with an unchanging level of output.) And, should a bank experience greater variability of output, it may utilize less specialized machinery and more temporary labor than a bank with stable output. The growth (or shrinkage) of output for each banking service was represented by the annual rate of change of the banking service, deposits, or loans as of the year-end for the five years 1956 through 1960. This variable (RC) was computed by regressing the common logarithms of demand deposits, time deposits, mortgage loans, instalment loans, business loans, and total assets, as of December 31, for the five years 1956

[7] The symbol "N" is used throughout, with a subscript to indicate the banking service to which it applies; e.g., N_d refers to the number of demand deposit accounts.

[8] The symbol "A" is used throughout, with a subscript to indicate the banking service to which it applies; e.g., A_d refers to the average balance of demand deposit accounts.

through 1960, separately, on years, where 1956 = 1, 1957 = 2, . . ., 1960 = 5.[9] The regression coefficients, then, were a multiple of the annual rates of change of the year-end banking service assets or liabilities.[10] The variability of output (V) was estimated by the standard error of the logarithms of the five year-end balances of each banking service, asset, or liability, for the years 1956 through 1960.

5. Differences of *factor prices* among observations is a problem for cross-section studies, as well as for time-series analysis. Although the sampled banks are located in a fairly homogeneous area, some are in or near large cities while others are in fairly remote areas. Since salaries were approximately 60 percent of the direct expense of bank operations (excluding interest on time deposits), a wage-rate index was constructed to adjust for regional wage differences. This index was computed by dividing the number of employees in banking and similar industries (insurance, savings and loan associations, savings banks, and credit unions) as of March 15, 1959, into the total wages paid for the first quarter of 1959 (for these industries) in the county in which each bank is located.[11] The wages variable, then, is the average wage paid for the first quarter per employee. It should be noted, therefore, that this variable will be most useful for the 1959 cross-section and less so for later years. The data for these computations were derived from social security (FICA) reports.[12] Since all wages paid up to $16,800 a year were reported in full on the first quarter FICA returns, and since all banks are required to file the return, the index is not likely to be biased by exclusion of data. However, the index does average out differences in skill and pay between jobs within banks, although this is less of a problem for the banking industry than for most other industries, since skill differences of most banking operations, as reflected by differences in wage rates, tend to be relatively slight.

6. The important distinction relating to *form of organization* for a study of bank costs is whether the bank is a unit or a branch bank. The percentage distribution of banks in the cross-sections between unit and branch banks, and the number of branches, is given in Table 1. Three types of variables were used in this study to estimate the existence (if any) of costs or cost savings due to branch banking: Log_{10} of the number of banking offices (NO); dummy variables where 1 = branch bank and 0 = unit bank (B_0); and a series of dummy variables where:

B_1 = 1 for banks with one branch, 0 for other banks;

B_2 = 1 for banks with two branches, 0 for other banks;

B_3 = 1 for banks with three branches, 0 for other banks;

B_4 = 1 for banks with four branches, 0 for other banks;

B_5 = 1 for banks with five or more branches, 0 for other banks.

[9] The year-end assets and liabilities had to be used for this computation, because more detailed output data (such as the number of accounts and loans) were not available for the early years.

[10] Had the variables been transformed to natural logarithms, the regression coefficients would have been the annual rates of change. Rather, they are 1/2.30259 of the annual rate. However, the use of the coefficients as an independent variable (RC) in the regressions computed for this study affects only the constant term of these regressions.

[11] Banking as an industry was not used alone because wage differentials for a type of labor, due to region, are a function of the total use of that type of labor in the region. The other industries mentioned utilize the same type of labor as do banks.

[12] U. S. Department of Commerce, U. S. Department of Health, Education and Welfare, *County Business Patterns, First Quarter 1959*, Part II, New England States, Washington: U. S. Government Printing Office, 1961.

Table 1

Percentage Distribution of Unit and Branch Banks in Samples

Year of Cross-Section	Unit Banks	Branch Total	Number of Branches				
			One	Two	Three	Four	Five to Twelve
1959	55%	45%	17%	17%	7%	4%	0%
1960	45	55	17	15	12	4	7
1961	44	56	18	14	11	5	8

Selection was made among these three forms according to the reduction effected in the standard error of estimate of cost.[13]

7. *Mergers* may affect current costs because of the dislocations caused by changes in and reorganization of management, etc. To account for this effect, a dummy variable (M), which assigned a 1 for the six banks that had merged within the period 1956 through 1960, and a 0 for the remainder that had not merged, was included in the regressions.

8. *Technology* was assumed to be the same for all the banks sampled. Banking is a homogeneous industry, and bankers tend to be a homogeneous people. While bankers certainly do not all think or act the same, generally they have similar knowledge of the technology of the industry, which is all that is required for this assumption to be valid.

III. *Data and Computation Procedures Used*

The data upon which this study is based were developed by the Federal Reserve Bank of Boston.[14] Their program was limited to banks with total assets of between $3.4 and $55.0 million.[15] The size distribution of the banks included in the samples is given in Table 2.[16] The procedure was to hold a seminar for all First Federal Reserve District member banks within the chosen size-range that wished to participate. The participating bankers were given instructions and forms with which to analyze their accounting records. Each bank allocated its incurred costs, assets, and liabilities to specific banking services or to indirect expense. The figures were reviewed by the Federal Reserve Bank and, if acceptable, were used as the basis for a report for each bank, in which total costs by banking service were compared with

Table 2

Size Distribution of Banks Included in the Samples

Total Assets (millions of dollars)	Number of Banks in Each Sample		
	1959	1960	1961
3.4 to 14.9	53	45	43
15.0 to 24.9	22	19	16
25.0 to 34.9	7	10	12
35.0 to 44.9	1	5	6
45.0 to 54.9	—	3	3
Total	83	82	80

[13] An analysis of the costs of branch banking is the subject of another paper, "Branch Banking and Economies of Scale," presented at the December meetings of the American Finance Association and published in the May 1965 "Proceedings" issue of the *Journal of Finance*.

[14] The data and help in interpreting it were made available to me as a Research Fellow of the Federal Reserve Bank of Chicago.

[15] The upper limit was lower for the years before 1959.

[16] The data were transformed to logarithms, a procedure that gives greater weight to the smaller banks. The transformation resulted in data that are uniformly distributed.

the average of these costs for a group of banks with approximately the same total demand deposits, time deposits, mortgage loans, etc.

The fact that the banks included in the samples participated voluntarily was advantageous for this study, because this demonstrates their concern with costs of operation. Such banks are more likely to be on the same long-run cost curve than would a random sample of banks.

Under the procedure followed, particular attention was given to the cost-allocation methods used by the banks. Salaries (the largest single item of cost, averaging 40 percent of total cost) were allocated to banking services directly where the employee worked only for a specific service (for example, a time-deposit teller), and by time-sheet analysis where he worked for several services. A similar approach was followed for non-payroll costs. Expenses for such items as supplies, collection expenses, FDIC insurance, interest, outside services, and credit reports were allocated directly to a specific banking service. Other expenses, such as advertising, occupancy expenses, and general administrative salaries, could not be allocated unambiguously and were classified as indirect expenses. The Federal Reserve Bank of Boston allocated these indirect expenses to specific banking services in proportion to the direct expenses previously allocated. Since this procedure is arbitrary (as are most, if not all, procedures for allocating indirect expenses), these costs were removed and analyzed separately.

Output and some other explanatory variables, such as the number of deposit accounts, number of loans, and amounts of deposits and loans were measured at the end of each month. A simple average of these end-of-month data was taken for the year. This procedure tends to reduce random variation and allows a more exact matching of output with costs than would be possible had the volume of loans or deposits as of December 31, for example, been used.

The study was replicated on data from the participating banks for 1959, 1960, and 1961. Approximately 60 percent of these banks were included in all three samples, and a varying percentage (from 13 to 36 percent) appears in only two of the three samples, as shown in Table 3.

Table 3

Number of Banks Included in Samples, by Number of Years

Year of Cross-Section	Total	Number of Banks Included in		
		Three Years	Two Years	One Year
1959	83	50	19	14
1960	82	50	29	3
1961	80	50	10	20

Over the three-year period, the size of the banks included in the samples increased somewhat, due to internal growth and to the addition, beginning in 1960, of several larger banks. It should be noted that not all of the banks offered every banking service analyzed. Therefore, the number of observations for several of the services is less than the number of banks shown in Table 3.[17]

These data were used to estimate long-run cost functions by means of multiple regression analysis. Scatter charts of direct costs on the number of accounts or loans were prepared for each banking service analyzed to determine the best form of the cost functions. These charts indicated the presence of curvilinearity and heteroskedasticity. Regressions were computed for direct cost on the output variables, their squares and cubes, and the other independent variables (such as the branch variables). The fits were good, but scatter charts of the residuals from

[17] Approximately 10 percent of the banks did not offer time deposit and/or mortgage loan services, and one bank did not offer instalment loans.

these regressions on the number of loans or accounts showed evidence of heteroskedasticity. Charts were then prepared of transformations of the variables; direct cost per loan or account and the square root and logarithm of each variable were plotted separately and jointly. The logarithmic transformation of all variables was the most successful; apparently, heteroskedasticity was eliminated, except for two special situations (time deposits and mortgage loans) which were adjusted for by the addition of constants before logarithms were computed.

All variables, then, were converted to common logarithms.[18] Since there appeared to be curvilinearity, even in the logarithms, the squares of the logarithms of the number of loans or accounts and average account or loan balances were included as independent variables. Scatter charts of the residuals on the number of accounts or loans from these regressions (the ones presented below in the body of this study) indicated that homoskedasticity was achieved.

The logarithmic transformation was useful for this study for several reasons other than the one discussed above. First, the use of logarithms and the square of the logarithms allows the estimated cost curves to be virtually of any theoretically recognized shape. In this way, the assumption of linearity, for which statistical cost studies often are criticized, was avoided. Second, the logarithmic form allows the direct estimation of elasticities from the coefficients of the independent variables (in most instances). Third, the relationship between the independent variables may be multiplicative rather than additive. The marginal cost of processing a checking account, for example, may be a function of the average account balances as well as the number of accounts processed. And, the wage index and branch banking variables should bear a proportional, rather than an additive, relationship to cost.

The independent variables on which the dependent variables were regressed are discussed in detail in sections IV through XI below. Only those variables with regression coefficients larger than their standard errors are presented. Standard errors are given in parentheses beneath the coefficients to which they apply. In addition, three other measures of reliability are presented: (1) the standard error of estimate; (2) R^2, the coefficient of multiple determination; and (3) the percentage of the standard error of estimate to the geometric mean of the dependent variable, in antilogarithms.

IV. *Demand Deposit Service*

The holding and transfer of funds on demand (checking accounts) is the most important service offered by commercial banks. Indeed, this function is unique to these institutions. Approximately 70 percent of the total deposits held by the sampled banks were demand deposits, although this percentage in 1960, for example, varied from 22 to 100 percent. Most banking operations relate to the servicing of individual accounts: bookkeeping, statements, and many auxiliary banking services, such as travelers checks, saving bond sales and redemptions, and note collection, are made available to depositors individually. Hence, the average number of accounts outstanding at each month end (N_d) was considered the basic output variable.

The average size of regular checking accounts (A_r) also should be an important determinant of operations costs, because extra banking services may be provided to customers who maintain larger balances. This variable also may serve to measure the cost to a bank of providing "free" services in lieu of interest, since the cost of these services should

[18] The dummy variables may be considered as 1 and 10, rather than 0 and 1, so that their logarithms are 0 and 1.

be related to the size of regular checking accounts. Special checking account balances were excluded (except for the 1959 cross-section, where data limitations made this exclusion impossible), for these extra services usually are not offered to special checking customers due to the small balances they maintain.

The rate of service charges on regular accounts (SC_r), the ratio of regular checking service charge income-to-regular checking deposits, in percentages, was included as a variable to adjust for situations where a bank provides extra services but charges the customer for them. Service charges on special accounts were not included in this computation (except for the 1959 regressions) because these charges represent income rather than a direct offset to the cost of extra services. Further, the absolute amount of special checking service charges is much larger than regular checking service charges. Therefore, inclusion of service charges on special checking accounts would provide only a measure of the relative volume of special checking accounts.

However, the ratio of the number of regular checking accounts-to-the total number of accounts (RN_d), in percentages, was included as a variable to account for differences in cost due to special checking.[19] Since the total number of accounts (N_d) was included in the regressions with RN_d, the regression coefficient of the latter variable estimated the cost effect of a change in the number of regular checking accounts and an offsetting change in the number of special checking accounts. A negative coefficient for RN_d is evidence of higher relative costs of special checking, while a positive coefficient indicates lower relative costs of special checking.

The processing of checks (home debits), deposits, and transit items (checks) by a bank is the most costly single demand deposit service. However, estimation of the difference in a bank's costs of processing different numbers of each of these items is difficult because of collinearity and the multiplicative feature of the logarithmic transformation. The collinearity results from the fact that large banks process more items, and have more accounts than small banks. Indeed, when the number of checks, deposits, and transit items were added to a regression which also included the number of accounts as an independent variable, the standard error and Student's t ratio of the regression coefficient of the number of accounts fell from 25.5 to 5.4. Further, the number of deposits and number of checks were so collinear that neither coefficient was greater than its standard error after the other variable entered the regression. The logarithmic transformation, which reduces the problem of heteroskedasticity, also assumes the existence of an underlying multiplicative relationship among the independent variables, an asumption that does not seem valid for these variables. Hence, it was necessary to transform the number of checks, deposits, and transit items before they could be included in a regression with the other output variables.

A time study made by the Research Institute of the National Association for Bank Audit, Control and Operations (NABAC) was used to prepare time factors with which the "items" variable was weighted.[20] The relative time factors determined were 1.000 for checks, .9475 for deposits, and .1660 for transit items.

[19] It is alleged by bankers that (1) special checking accounts are more costly because these customers require more help from bank personnel; or (2) that regular checking accounts are more costly because special accounts are uniform and more amenable to mechanized handling.

[20] The NABAC Research Institute, *A Study of Dual-Posting Fully-Deferred Demand Deposit Accounting*, 1959, and *A Study of Single Posting Methods of Demand Deposit Accounting*, Vol. I, 1959.

The number of deposits and transit items at each bank was multiplied by .9475 and .1660, and the products were added to the number of checks to form a new variable, weighted items (WI). This variable was still collinear with the number of accounts (N_d), since its inclusion in a regression with the latter variable had almost the same effect on the Student's t ratio of its regression coefficient as did the "items" variable singly. To eliminate this collinearity, the weighted items of each bank were divided by the number of accounts of each bank to form a new variable, weighted items per account (WIN). As the regressions presented below show, the transformation was effective for this purpose. The ability of the weights to represent the relative direct cost of processing checks, deposits, and transit items was tested by including the weighted items per account variable (WIN) in a regression with the other independent variables, and then recomputing the regression with the number of checks per account, deposits per account, and transit items per account in its place. The resultant standard error of estimate and the coefficients and standard errors of the other independent variables were almost exactly the same for the two regressions. Hence, it was concluded that the weights used were valid.

Total assets or total deposits could not be included in the regressions to test for inter-departmental economies or diseconomies of scale because of collinearity among these variables and the number of checking accounts. Instead, the ratio of demand-to-total deposits was used as an independent variable in the 1960 regressions. However, the standard error of the coefficient for this variable was four times the coefficient, and its partial correlation coefficient with the dependent variable (direct expense) was .01. A test for possible cost relationships between demand and time deposits was made by including total time deposits in the 1960 regressions. Its coefficient was one-fifth the size of the coefficient's standard error, and the partial correlation coefficient of the variable with direct expense was −.02. Hence, it was concluded that inter-departmental economies or diseconomies of scale were not discernible, and these variables were not used for the 1959 or 1961 regressions.

The common logarithm of direct expenses (E_d) was regressed on the independent variables discussed just above and in section II, for each of three years. The dependent variable, direct expenses, includes the expenses of the teller, proof, and bookkeeping departments. Approximately 67 percent of these are payroll expenses, 10 percent are furniture and fixture maintenance, rental, and depreciation, 10 percent are printing, stationery and supplies, and the balance represents postage, miscellaneous taxes, etc.

The variables for merger (M) and the annual rate of change of demand deposits as of December 31, 1956 through 1960 (RC_d) were initially included in the 1960 regression, but they had standard errors at least twice as large as their coefficients and hence were discarded. The variability of year-end demand deposits, 1956 through 1960 (V_d), had a coefficient that was larger than its standard error, as follows:

$$\hat{E}_d = -.635 + .863\,N_d + .021\,WIN^2 + .509\,A_r + .276\,RN_d + .138\,SC_r$$
$$(.044)\quad (.019)\quad (.087)\quad (.253)\quad (.059)$$
$$+ .074\,B_2 + .129\,B_3 + .066\,B_4 + .115\,B_5 + .007\,V_d$$
$$(.025)\quad (.040)\quad (.027)\quad (.046)\quad (.005)$$
$$(\text{Standard error of estimate} = .0676)$$

This equation should be compared with the one presented below in which V_d is excluded. The coefficients of the other variables are almost the same, and

the standard error of estimate is but .0002 lower. Since the Student's t ratio of V_d of 1.227 is significant only at the greater than .10 level (one-tail test), and since the cost of computing this statistic is quite great, it was not included in the 1959 and 1961 regressions.

Table 4 summarizes the regressions computed for the three cross-sections. It should be noted that the 1959 regressions are not comparable with the 1960 and 1961 regressions in several respects. The average account balance (A_r) and service charge (SC_r) variables differ, since detailed data on the deposits and service charges for regular and special checking accounts were not available for 1959. The average size of regular (A_r) and total (A_d) account balance is closely related. (Their simple correlation coefficients are .73 for the 1960 and .82 for the 1961 cross-sections.) However, they interact with the other variables differently and measure different outputs. Hence, neither their coefficients nor the coefficients of the other independent variables can be compared. An exception is the number of accounts (N_d) variable. There appears to be little collinearity between this variable and the average account balance variables. Consequently, the 1959 elasticity and marginal cost estimates for N_d may be compared with the 1960 and 1961 estimates.

Economies of Scale and Marginal Costs. The elasticities, with respect to the number of accounts, can be read directly from Table 4. The coefficients of N_d indicate slight economies of scale in 1959 (.986) and an increase in economies in 1960 (.856) and 1961 (.793). Although three years are hardly enough to establish a trend, there does appear to have been a steady increase, perhaps due to increasing mechanization in the larger banks.

The marginal cost of a unit change in the number of checking accounts (N_d) is comparable for the 1959, 1960, and 1961 regressions, because there was little collinearity between the number of accounts and the average account balance variables. Further, holding the other variables constant at their mean values had little effect on the computation of the marginal cost per account, since the change in the other variables associated with a change in the number of accounts was practically zero. The marginal cost is given at the geometric mean and extreme values of the number of accounts in Table 5 and Chart I.

V. *Time Deposit Service*

The ratio of time deposits-to-total deposits varies widely for the banks sampled. In the 1960 cross-section, for example, time deposits averaged 30 percent of total deposits, but ranged from 5 to 78 percent for the 73 banks that provide this service, while 9 banks did not offer the time deposit service.

The average number of accounts (N_t) should be an important output variable, because most of the time deposit operations center around the individual account. The average balance of accounts (A_t) was included as an explanatory variable for two reasons. First, it may serve to account for differences in cost due to differences in deposits and withdrawals per account at the banks sampled, since account activity probably is related to the size of the account. Second, banks may provide extra services and special attention to large depositors.

Special services made available to demand depositors, such as note collection and letters of credit, are not usually offered to most time depositors, since they are paid for their funds directly (interest). However, one special service, Christmas Club accounts, which pays no interest, is offered to time depositors.[21]

[21] One additional time deposit service, certificates of deposit, might be mentioned. The depositor buys these certificates in large denominations, usually of $1,000 or more. The certificates mature after specified periods, and

Table 4

Demand Deposits, 1959-1961, Annual Direct Expenses (E_d)
(All Variables Are in Common Logarithms)

Independent Variables*	Regression Coefficients (Standard Errors)		
	1959	1960	1961
N_d (number of accounts)	.986 (.041)	.856 (.044)	.793 (.052)
A_d^2 (average balance of all accounts squared)	.077 (.016)		
A_r (average balance of regular accounts)		.502 (.088)	.371 (.092)
SC_d (service charge rate on all accounts)	.172 (.080)		
SC_r (service charge rate on special accounts)		.142 (.059)	.154 (.068)
RN_d (ratio of the number of regular to the total number of accounts, in percentages)		.253 (.090)	.195 (.095)
WIN (Weighted activity items—checks, deposits, and transit items—per account)	3.247 (1.900)		
WIN^2 (WIN squared)	−.643 (.399)	.024 (.019)	.070 (.023)
B_1 (1 for one branch, 0 for other than one branch)			.036 (.024)
B_2 (1 for two branches, 0 for other than two branches)		.083 (.024)	.076 (.027)
B_3 (1 for three branches, 0 for other than three branches)		.067 (.027)	.103 (.032)
B_4 (1 for four branches, 0 for other than four branches)		.108 (.046)	.163 (.043)
B_5 (1 for five or more branches, 0 for other than five or more branches)		.139 (.039)	.151 (.042)
Constant Term	−3.639	−.554	−.031
R^2	.9201	.9560	.9518
Standard Error of Estimate	.0793	.0678	.0712
In Antilogarithms: Mean of Dependent Variable	$85,100	$112,000	$116,300
Standard Error of Est. as percentage of Mean of Dependent Variable	−16.7 and +20.0	−14.4 and +16.9	−15.1 and +17.8
Number of Observations	83	82	80

* The variables reported are those whose regression coefficients are larger than the standard errors of the coefficients.

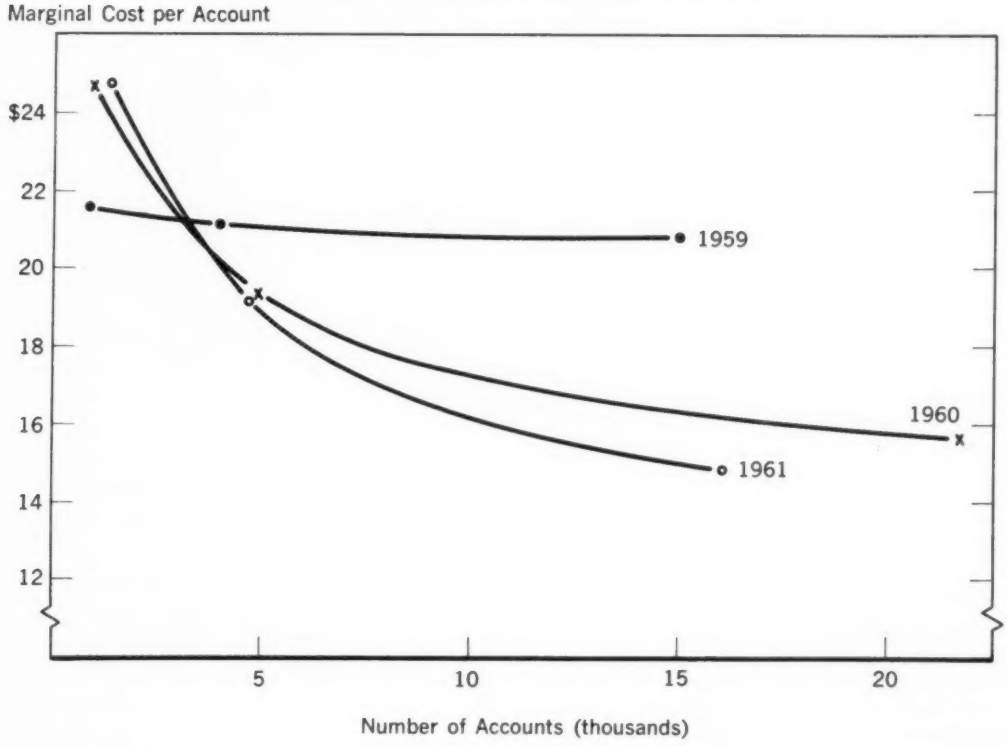
Table 5

Demand Deposits, Marginal Annual Direct Cost Per Account
(Other Variables Held Constant at Their Geometric Mean Values)

Year	Minimum Number		Geometric Mean		Maximum Number	
	At No. of Accts.	Marginal Cost	At No. of Accts.	Marginal Cost	At No. of Accts.	Marginal Cost
1959	984	$21.55	4,009	$21.18	15,000	$20.80
1960	905	24.66	4,972	19.32	21,710	15.63
1961	1,387	24.71	4,772	19.14	16,100	14.86

Chart 1

Demand Deposits, Marginal Annual Direct Cost per Account,
Other Variables Held Constant at their Geometric Mean Values



An interesting question is whether banks incur additional operations costs in providing this service. To test the hypothesis of additional cost related to the Christmas Club service, the ratio of the number of savings accounts-to-total time accounts (RN_t) was included in the regressions as an independent variable. The findings with respect to this variable were inconclusive, as Table 6 shows. It was of little significance in the 1959 and 1960 regressions (its coefficient was half the standard error of the coefficient), but quite significant for the 1961 regressions. The coefficient of RN_t for the 1961 direct cost regression has a sign of −.466, an indication of additional cost due to Christmas Club accounts. However, the inconsistent findings make it impossible to reach any conclusions with respect to the cost of the Christmas Club service.

The rate of interest paid was included as a variable in the 1960 regressions, since banks may substitute service for interest payments. If this obtains, the coefficient of the interest rate variable would be negative. However, the standard error of this variable was eighteen times the size of its coefficient (which was —.01), so the "substitution" hypothesis was rejected and the variable was not included in the regressions for 1959 and 1961.

The existence of inter-departmental cost relationships was tested by including total assets (TA) in the 1960 regressions. This variable is highly collinear with the number of accounts (N_t); therefore, the ratio of time-to-total deposits (RT) was included as an independent variable. The problem of collinearity was solved, but the standard error of this variable was about twice the size of its coefficient (.07 and .04). Therefore, it was concluded that the hypothesis of inter-departmental cost relationships does not obtain, and neither TA nor RT were used for the 1959 or 1960 regressions.

The dummy variable for merger (M), the annual rate of change of time deposits as of December 31, 1958 through 1960 (RC_t), and the variablility of time deposits as of December 31, 1956 through 1960 (V_t), were included in the 1960 regression. Since their regression coefficients were all considerably smaller than the standard errors of the coefficients, the variables were not used further.

The dependent variable, direct costs, does not include interest payments, although these were 85 percent of total direct costs. This exclusion was made because interest payments are related directly to the dollar amount of deposits and can be computed easily without the aid of multiple regression analysis. In addition, they are a function of the market in which a bank operates and, hence, are not of interest for a study of economies of scale in banking operations. The balance, approximately two-thirds of which are salaries, were regressed on output and the other independent variables.

Scatter charts, prepared to determine the best form for the variables, showed that the logarithmic transformation was most suitable. (See Section III.) However, this transformation over-weighted the low values of direct expenses and number of accounts, causing heteroskedasticity. Constants were added to these variables prior to taking logarithms to adjust this situation. The addition of 1,000 to each variable appeared to correct the heteroskedasticity, and these adjusted variables were used in the regressions. The results of the regressions are given in Table 6.

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interest is paid on them. These certificates usually are purchased by business enterprises as temporary investments. Since few of the banks in the samples sold many of these certificates, they are not included in the analysis.

Table 6

Time Deposits, 1959-1961, Annual Direct Expense Plus $1,000 ($E_{tc}$)
(All Variables Are in Common Logarithms)

Independent Variables*	Regression Coefficients (Standard Errors)		
	1959	1960	1961
N_{tc} (number of accounts + 1,000)	.768 (.061)	1.020 (.059)	.940 (.060)
A_t (average balance of accounts)	.393 (.088)	.391 (.089)	.356 (.112)
W (relative wages)	.994 (.264)	.804 (.292)	.689 (.285)
B_2 (1 for two branches, 0 for other than two branches)	.102 (.042)		
B_3 (1 for three branches, 0 for other than three branches)	.181 (.062)	.103 (.051)	.110 (.052)
B_4 (1 for four branches, 0 for other than four branches)			.167 (.076)
RN_t (number of savings accounts/total time accounts, in percentages)			−.466 (.250)
Constant Term	−2.940	−3.327	−2.591
R^2	.8286	.8634	.8638
Standard Error of Estimate	.1320	.1407	.1403
In Antilogarithms: Mean of Dependent Variable	$8,814	$11,560	$15,200
Standard Error of Est. as percentage of Mean of Dependent Variable	−26.2 and +35.5	−27.4 and +38.3	−27.8 and +38.1
Number of Observations	73	73	73

* The variables reported are those whose regression coefficients are larger than the standard errors of the coefficients.

Table 7

Time Deposits, Elasticity of Direct Operations Expenses (E_t) with Respect to the Number of Accounts (N_t)

Year of Sample	At Values of the Number of Accounts			
	Mean Less One Standard Deviation	Geometric Mean	Geometric Mean of 1960 Sample	Mean Plus One Standard Deviation
1959	.497	.679	.714	.736
1960	.881	.955	.955	.988
1961	.797	.878	.870	.912

Economies of Scale and Marginal Costs. The coefficients of the independent variables, since they are in logarithmic form, would give the economies or diseconomies of scale directly if constants had not been added to the dependent variable, E_t, and to the number of accounts, N_t. The latter being the case, an adjustment to the coefficients was made, and the elasticities of direct costs with respect to the number of accounts is shown for several values of N_t in Table 7.[22]

There appear to be some economies of scale with respect to the number of accounts. Thus, the banks averaged an 85 percent increase in direct cost with a doubling of the number of accounts. However, the trend towards increasing economies of scale indicated by the demand deposit data is not evident here. This finding is consistent with the hypotheses proposed for demand deposits of increasing economies due to mechanization, since there were few improvements in time deposit mechanization during this period.

The marginal costs computed for the number of accounts are at the number plus 1,000, the constant added for the regressions. Thus, in arriving at the marginal cost of an account at the 1961 geometric mean of 7183, 8183 was used as the variable, N_{tc}, in computing the partial derivative of direct expense with respect to the number of accounts. The number of accounts given in Table 8 is the number before the constant was added. Marginal cost is presented at the geometric means and extreme values of the variables. The values for different years are not strictly comparable, since the means and extreme values differ.

For purposes of comparison, marginal cost can be evaluated at the same mean value for "number of accounts." Using 1959 as the base year, this computation gives marginal cost estimates of $1.79 for 1960 and $1.98 for 1961. Thus, there appears to have been an upward shift in the marginal cost curve. Of course, the estimates developed could differ solely because of sampling error of nonrecurring events.

VI. *Mortgage Loans Service*

Mortgage loans are monthly-repayment, long-term loans secured by mortgages on real property. Loans of this type comprised about 15 percent of the total assets of the sampled banks. However, approximately 10 percent of the banks did not make mortgage loans, and the ratio of mortgage loans-to-total assets (for those that did) ranged, in percentages, from .02 to 36.87 percent.

The major work for the mortgage loan service is the making of new loans and the servicing of existing loans. The most important explanatory variable of direct mortgage loan expense, then, would seem to be the number of new and existing loans. While the number of existing loans (N_m) are available data, the number of loans made are not. Because of this data limitation, it must be assumed that loans made are proportional to loans outstanding for all banks.

The average size of loan variable (A_m) was included to account for any extra costs of checking and maintaining sur-

[22] Where a constant was added to the variables, as in the time deposits and mortgage loan regressions, the basic equation fitted was:

$\log (E^\circ + c) = \log a + b \log (N^\circ + g)$, where the asterisks denote antilogarithms and c and g are the constants added.

The derivative of E° with respect to N°, then, is,

$$\frac{dE^\circ}{dN^\circ} = b\frac{E^\circ + c}{N^\circ + g}$$

and the elasticity of E° with respect to N° is:

$$\frac{dE^\circ}{dN^\circ} \cdot \frac{N^\circ}{E^\circ} = b\frac{E^\circ + c}{N^\circ + g} \cdot \frac{N^\circ}{E^\circ} = b\frac{(E^\circ + c)/E^\circ}{(N^\circ + g)/N^\circ}$$

The final term is the correction term for the coefficient b.

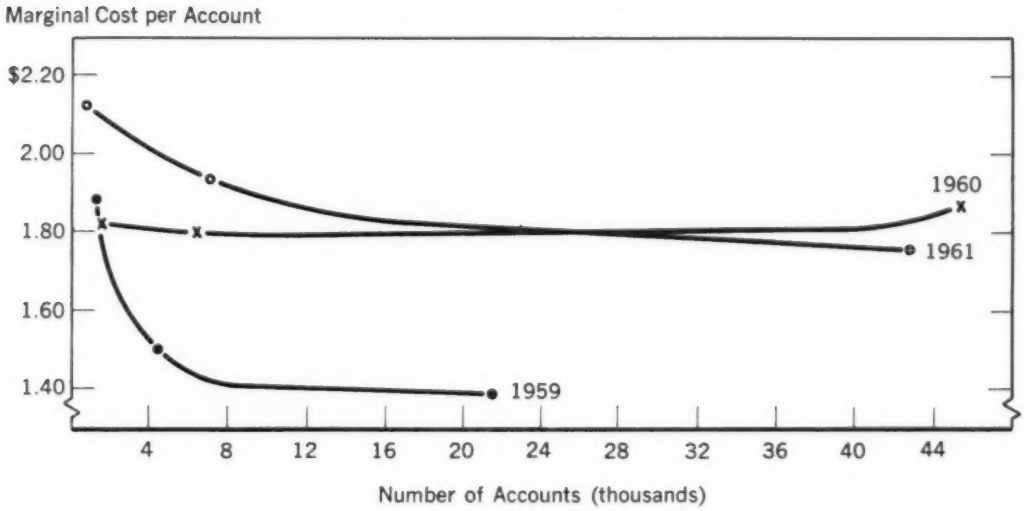
Table 8

Time Deposits, Marginal Annual Direct Costs per Account (Other Variables Held Constant at their Geometric Mean Values)

Year	Minimum Number		Geometric Mean		Maximum Number	
	At No. of Accts.	Marginal Cost	At No. of Accts.	Marginal Cost	At No. of Accts.	Marginal Cost
1959	1268	$1.88	4409	$1.50	21,438	$1.38
1960	1500	1.82	6416	1.80	45,344	1.87
1961	736	2.12	7183	1.94	42,739	1.76

Chart 2

Time deposits, Marginal Annual Direct Cost per Account, Other Variables Held Constant at their Geometric Mean Value



veillance over the additional credit and collateral required for larger loans. These larger loans may include loans made on industrial property and, in some instances, "convenience" loans made for favored customers.

Another factor that has been considered important is the relative volume of government insured (FHA and VA) mortgage loans processed by a bank. It often is claimed that government insured mortgages require more paper work than conventional mortgages, and, hence, impose additional costs on a bank. The ratio of the total dollar volume of FHA and VA loans-to-the total dollar volume of mortgage loans (in percentages) as of December 31, 1960 was included as a variable to test this hypothesis.[23] It was found to be of little or no significance for explaining cost, since the regression coefficient is one-tenth of its standard error ($b = -.003$, $s_b = .03$) and its partial correlation coefficient with the dependent variable (E_{mc}) was $-.01$. Because of these findings and the expense of gather-

[23] This ratio, in percentages, ranges from zero to 7.6: its mean in $\log_{10}$ is .746 and its standard deviation .871. Zero ratios were included in the logarithmic regressions as zero.

ing similar data for the 1959 and 1961 cross-sections, no further test of this hypothesis was attempted.

"Total assets" (TA) was also included as an independent variable in the 1960 cross-section to test for cross-economies or diseconomies of scale between functions. However, the regression coefficient was but one-fifth of its standard error ($b = -.02$, $s_b = .10$), and the partial correlation coefficient of TA with the dependent variable (E_{mc}) was $-.02$. It was concluded that there was no evidence of cross-economies or diseconomies of scale and this variable was not included in the 1959 and 1961 cross section regressions.

The dummy variable for mergers (M) was tried in the 1960 regression, but it was of little significance. (The standard error of its regression coefficient was several times larger than the coefficient.) Variables which measured the annual rate of change of mortgage loans as of December 31, 1956 through 1960 (RC_m), and variability of mortgage loans as of December 31, 1956 through 1960 (V_m) were included in the 1960 regression. The resultant estimates are as follows:

As was indicated in Section III, the non-logarithmic forms were rejected because of apparent heteroskedasticity. However, it was found that a logarithmic transformation of the number of mortgage loans (N_m) and direct cost (E_m) resulted in greater variance in the lower ranges because of the presence of several banks with exceptionally small numbers of loans and low direct expenses. To adjust for this condition, constants were added to the number of loans and to direct expense before taking logarithms. Adding 100 to the number of loans ($N_m + 100 = N_{mc}$) and \$1000 to direct expense (E_m + \$1000 $= E_{mc}$) appeared to correct the heteroskedasticity. These transformed variables were used in the regressions in Table 9.

Various dummy variables for branch banking were tried in the regressions for all three years. The number-of-branches variable, NO, and unit-branch variable, B_0, were not as effective in describing the data as were the individual number-of-branches variables (B_1, B_2, B_3, B_4, and B_5). However, even these latter variables gave inconsistent coefficients among the samples, both in their magnitudes and "significance." Hence, it was decided that

$$\hat{E}_{mc} = \underset{}{.427} + \underset{(.077)}{1.185\ N_{mc}} + \underset{(.106)}{.452\ A_m} + \underset{(.055)}{.075\ B_1}$$

$$+ \underset{(.094)}{.145\ B_4} - \underset{(.366)}{.533\ W} - \underset{(.080)}{.121\ RC_m} + \underset{(.043)}{.078\ V_m}$$

The Student's t values of RC_m and V_m were 1.506 and 1.821, which are "significant" at the .08 and .05 levels (one-tail test). However, these variables were not used further, since the cost of gathering the data and computing the variables for the 1959 and 1961 samples far exceeded their value as explanatory factors of cost. W, the relative wage deflator, had a coefficient greater than its standard error in the 1960 sample only.

To determine the best form for the variables on which regressions were run, several scatter charts were constructed. their effect was essentially random, and they were excluded as explanatory variables.

The variables regressed, then, and the results are given in Table 9. In addition, different branch variables were "significant" in different years. Hence, the effect of branch banking on cost was considered to be weak and inconsistent, and further computations were made with the branch banking variables excluded. This conclusion did not depend on the data from the very large branch banks, since the 1960 data were computed

Table 9

Mortgage Loans, 1959-1961, Annual Direct Expense Plus $1,000 ($E_{mc}$)
(All Variables Are in Common Logarithms)

Independent Variables*	Regression Coefficients (Standard Errors)		
	1959	1960	1961
N_{mc} (number of loans + 100)	.997	1.139	1.097
	(.078)	(.071)	(.068)
A_m (average size of loans)	.352	.335	.303
	(.094)	(.092)	(.105)
Constant Term	−.078	−.357	−.081
R^2	.7039	.7873	.7896
Standard Error of Estimate	.1431	.1593	.1813
In Antilogarithms: Mean of Dependent Variable	$3,092	$5,301	$6,840
Standard Error of Est. as percentage of Mean of Dependent Variable	−38.1 and +39.0	−32.3 and +44.3	−34.1 and +51.5
Number of Observations	74	74	74

* The variables reported are those whose regression coefficients are larger than the standard errors of the coefficients.

Table 10

Mortgage Loans, Elasticity of Direct Expenses (E_m) with respect to the Number of Loans (N_m)

Year of Sample	At Values of the Number of Loans			
	Mean Less One Standard Deviation	Geometric Mean	Geometric Mean of 1960 Sample	Mean Plus One Standard Deviation
1959	.702	.851	.853	.917
1960	.733	.959	.959	1.046
1961	.708	.932	.909	1.020

with the banks having five or more branches excluded; the resultant coefficients were almost exactly the same as they were with these banks included.

Economies of Scale and Marginal Costs. The elasticities of direct costs with respect to output could have been determined directly from the coefficients of the number-of-loans variable, had constants not been added to direct costs and the number of loans. An adjustment was made to the coefficients, and the correct elasticities are given in Table 10.[24] Thus, a 10 percent increase in the number of loans was accompanied, on the average for the three samples, by a 9.07 increase in direct cost.

The marginal cost per loan is presented in Table 11 and Chart 3. The number of loans given in the table and chart is the number before the constant, 100, was

[24] See footnote 22 for the method of adjustment used.

Table 11

Marginal Annual Direct Cost Per Mortgage Loan
(Average Loan Balance Held Constant at Its Geometric Mean Value)

Year	Low		Mean		High	
	At No. of Accounts	Marginal Cost	At No. of Accounts	Marginal Cost	At No. of Accounts	Marginal Cost
1959	10	$17.53	250	$17.46	1,118	$17.42
1960	10	18.28	254	21.63	1,386	26.42
1961	118	22.03	302	23.38	5,129	29.98

Chart 3

Mortgage Loans, Marginal Annual Direct Cost per Loan,
Average Size of Loan Held Constant at Its Geometric Mean Value

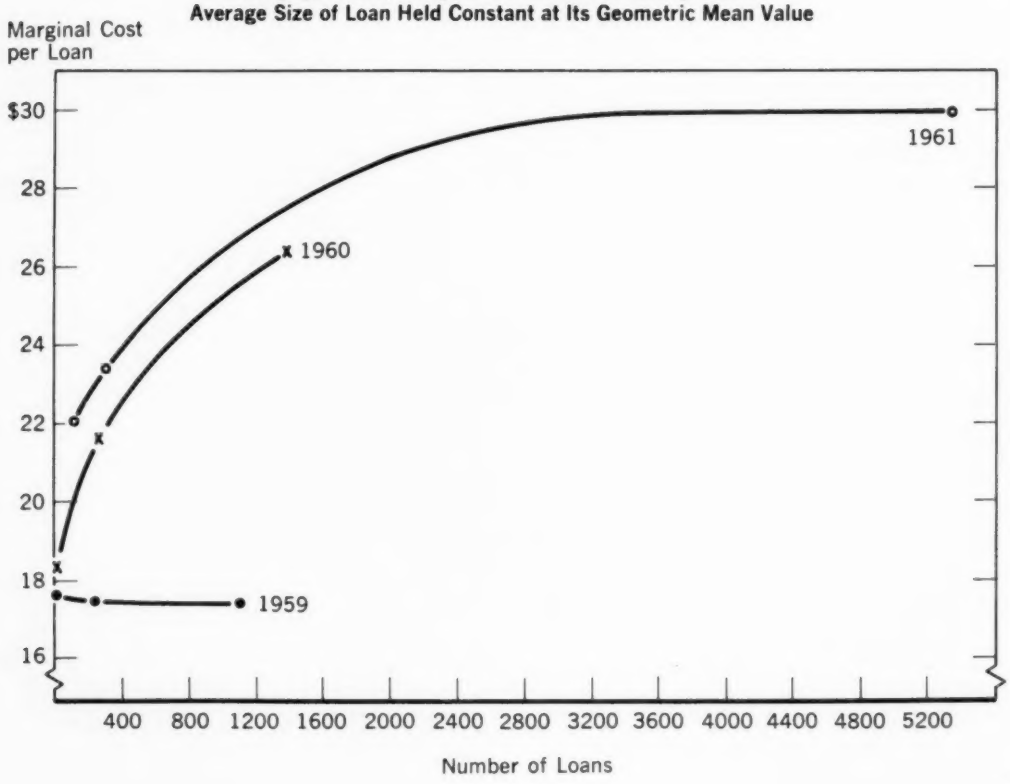
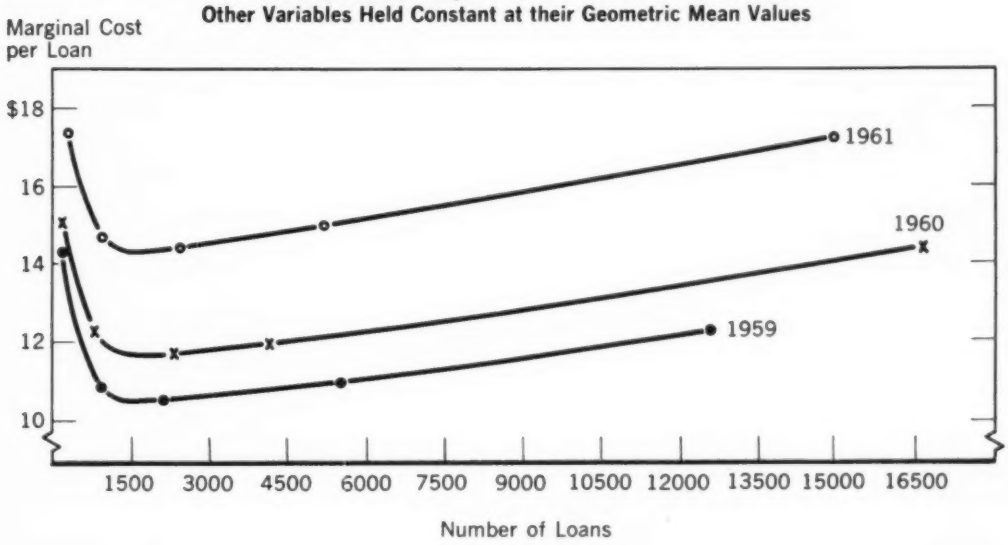


Chart 4

Instalment Loans, Marginal Annual Direct Cost per Loan, Other Variables Held Constant at their Geometric Mean Values



added for the regressions. The amounts given for the three years are not directly comparable, since the extreme and mean number of loans differ. A comparison can be made, however, by using the 1959 geometric mean number of loans as a base. Marginal cost, then, at the 1959 mean, is $21.58 for 1960, and $23.01 for 1961.

VII. *Instalment Loans Service*

Instalment loans are monthly repayment, short-term loans. They are usually payable within two years, although maturities for some types of loans, such as automobile loans, may be for as long as four years. This service has seen rapid growth since World War II. Prior to that time, banks were slow to extend short-term direct credit on a monthly repayment basis to consumers and others, although for years they had extended such credit to finance companies. Today, instalment loans represent a sizeable proportion of many banks' portfolios. In the 1960 sample, for example, instalment loans ranged from 1.75 percent to 35.74 percent of the banks' total assets. The distribution of these percentages, however, is skewed towards the lower percentage.

The number of instalment loans outstanding (N_1) should be the most important explanatory variable, since most operations are related to the records kept on individual loans. This variable includes the costs of acquisition and maintenance of instalment loans and, to a large extent, the costs of administering delinquencies. The number of loans made and the number of loan repayments processed were reported for the 1960 and 1961 samples, and these variables were included in the regressions. However, the degree of multi-collinearity between the number of loans outstanding, and the number of loans made and payments processed, made estimation of the cost effects due to the latter variables impossible. The number of loans (N_1) was used, since it "explained" more than these variables.

The square of the logarithm of the number of loans was tried as an alterna-

tive form of the variable for the instalment loan regressions (as well as for the other banking services regressions). In all three samples, the squared form proved superior to the unsquared form for explaining the variance of the dependent variable.

The average loan balance (A_i) may also be an explanatory variable of costs, in so far as it measures the relative cost of checking the credit references of customers who desire larger loans. It may also reflect the cost of recording chattel mortgages on goods, such as automobiles, for which larger, longer-term loans are granted.

The average earnings on loan balances outstanding (Y_i) was included as an explanatory variable, since a bank may choose to accept loans that are more risky and more costly to handle and charge a concomitantly higher rate of interest.[25] Higher yielding and more risky loans may be more costly to administer than other loans, because of the necessity of making a more careful credit check of the applicant and more extensive interviewing by more highly-skilled credit officers than would be required for safer loans. The variable that had to be used in the regressions was computed by dividing "total loan portfolio" into "total loan income" (discount and miscellaneous charges). The quotient is the gross rate of interest currently earned on the average loan balances outstanding, not the compound net interest yield on instalment loans. The measured variable and the desired variable differ because of bank accounting procedure.[26]

"Total assets" was tried in the regression to test for over-all economies or diseconomies of scale. However, it was multi-collinear with the other variables, especially N_i^2, A_i and the number-of-offices variable, NO. Since it did little to reduce the standard error of estimate (it reduced it by .002), this variable was not used for the final regression.

The merger (M) annual rate of change of instalment loans as of December 31, 1956 through 1960 (RC_i), and variability of instalment loans as of December 31, 1956 through 1960 (V_i) variables were included in the 1960 regressions only. Their coefficients were but a small fraction of their standard errors and, hence, these variables were not used for the 1959 and 1961 regressions.[27]

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[25] Alternatively, higher average earnings may reflect the market in which a bank operates, in which event there need not be any relationship between Y_i and direct cost.

[26] Banks credit to income an equal portion of the total discount on each loan, each month. Thus, for a $3,600, 36-month loan with $720 of discount, $\frac{1}{36}$ x $720 = $20 a month is credited to income. The bank's account books will show interest income of $240, and an average loan balance outstanding of $3,000, or a yield of 8 percent, while the compound interest yield actually is approximately 14 percent. Thus, the variable used in the regression understates the actual yield for banks with new, long-term loans, and overstates it for banks with almost-paid-off loans. Unfortunately, the actual yield could not be obtained, since most banks do not maintain their books so as to allow this computation to be made from income and asset data.

[27] Since lending practices and some bookkeeping procedures differ for different types of loans, the ratio of direct loans-to-total loans (PD) and of indirect loans-to-total loans (PI), in percentages, were included in the 1960 and 1961 regressions (these data were not available for the 1959 cross-section). Dollar values were used since the number of each type of loan is not available. However, these variables, both alone and separately, were not very meaningful. Used in the 1960 regressions, the coefficient (and standard error) of PD ranged from −.09 (.07) to −.13 (.08), depending upon the other independent variables; while PI's coefficient never exceeded its standard error. In the 1961 regressions, the coefficients of neither variable were as much as one-half their standard errors This result is surprising and therefore was tested further.

It was hypothesized that the lending practices of branch banks may differ considerably from those of unit banks. The branch banks,

Table 12

Instalment Loans, 1959-1960, Annual Direct Expense (E_i)
(All Variables Are in Common Logarithms)

Independent Variables	Regression Coefficients (Standard Error)		
	1959	1960	1961
N_i^2 (number of loans squared)	.131 (.009)	.131 (.006)	.130 (.007)
A_i (average balance of loans)	.669 (.130)	.740 (.110)	.636 (.110)
Y_i (interest yield earned)	.403 (.270)	.582 (.227)	.674 (.257)
NO (number of banking offices)	.152 (.073)	.126 (.047)	.119 (.052)
W (relative wages)	1.117 (.318)	1.000 (.236)	.936 (.247)
Constant Term	−2.678	−2.692	−2.226
R^2	.8723	.9331	.9146
Standard Error of Estimate	.1462	.1076	.1247
In Antilogarithms: Mean of Dependent Variable	$22,950	$31,730	$37,250
Standard Error of Est. as percentage of Mean of Dependent Variable	−28.6 and +40.0	−21.9 and +28.1	−25.2 and +33.3
Number of Observations	82	81	80

Table 12 presents the regressions for the three annual samples.

having more outlets than unit banks, may process more direct loans centrally, and, if there were economies of scale, would be more efficient. Inclusion of dummy or other variables to distinguish between branch and unit banks may not be sensitive enough to measure this difference, if it exists. To test this hypothesis, the sample was divided into branch and unit banks, and separate regressions were computed for each group, using the same variables (except that the number-of-offices variable was included for the branch bank regression). The result was that the coefficients and standard errors for all of the variables were changed very slightly, and the coefficient (and standard error) for PD was −.13 (.08) for the unit banks and −.10 (.08) for the branch banks, and the standard errors of PI for both regressions were larger than the coefficients. Therefore, the hypothesis was rejected.

Economies and Diseconomies of Scale and Marginal Costs. Since the square of the logarithm of the number of loans was used in Table 11, the cost elasticity of output cannot be read directly from that table. Nor is it a constant. It is computed for several values of N_i in Table 13. The data indicate decreasing economies of scale. However, the economies are relatively greater for smaller than for larger operations.

The marginal cost estimates presented in Table 14 also indicate a relative cost advantage of smaller operations. The apparent increase in marginal cost from 1959 through 1961 is not a result of differences in the geometric means of the number of loans. If the 1959 mean is used for 1960 and 1961, the marginal

Table 13

Instalment Loans, Elasticity of Direct Expenses with Respect to the Number of Loans

Number of Loans	Elasticity		
	1959	1960	1961
Geometric Mean less One Standard Dev.	.750	.871	.973
Geometric Mean	.757	.881	.948
Geometric Mean plus One Standard Dev.	.793	.887	.980

Table 14

Instalment Loans, Marginal Annual Direct Cost per Loan (Other Variables Held Constant at their Geometric Mean Values)

Year	Minimum Number		Geometric Mean		Maximum Number	
	At No. of Loans	Marginal Cost	At No. of Loans	Marginal Cost	At No. of Loans	Marginal Cost
1959	152	$14.35	2,116	$10.52	12,508	$12.30
1960	175	$15.10	2,313	$11.70	16,649	$14.45
1961	301	$17.38	2,423	$14.42	14,953	$17.26

cost estimates are $11.69 and $14.45. Whether there has been a shift to the right in the marginal cost curve, or whether the data simply result from random fluctuations, cannot be ascertained.

IX. *Business Loans Service*

Business loans include all loans except mortgage and instalment loans. While most of these loans are term or demand business loans, a small number is included that are similar to short-term investments, such as commercial paper purchased and federal funds sold,[28] and personal loans not made on an instalment basis. The banks in the samples held about 24 percent of their loans and securities as business loans, although the percentage ranged from 3 to 69 percent.

While a single type of loan dominates the business loans service, it is difficult to analyze because variations within this type are great. For example, differences in risk among loans result in differences in operating expenses, such as the cost of credit investigation. Inclusion of the gross earnings yield on loans as an independent variable accounts for some of this difference, but certainly not all of it.

The direct expense of the business loan function (E_b) consists almost entirely of salaries and fringe benefits. The only other direct expense worth noting is for credit reports (approximately 12 percent). One reason for this high proportion of salaries is that the higher paid officers of the bank often are assigned to this function. This makes the analysis of the business loan service more difficult,

[28] It often is claimed that the highly liquid loans require less operations effort by banks than "ordinary" business loans. To test this hypothesis, the ratio of these highly liquid loans-to-the total business loans portfolio, in percentages, was entered as an independent variable in the 1960 regressions. These percentages range from zero to 15 percent, with a geometric mean of 3.1 percent. Perhaps because of this small range, the variable was not significant (its coefficient is −.012, standard error .032).

since these salaries usually are not completely determined by the bank's activities in a particular year.

The average number of loans (N_b) was chosen as an output variable because an important part of the operations of the business loan function is related to the individual loans: records must be posted, notices sent out, and forms prepared. The number of new loans would be desirable as an explanatory variable, but these data were not available. However, since most business loans are for periods of less than one year, the average number of loans outstanding, N_b, should serve to measure both the cost of maintaining the records for loans and part of the cost of making loans.

The average size of loans, A_b, should be an important explanatory variable, since many of the costs of making new loans and providing special attention to current loans customers are related to the size of the loan. Thus, a larger loan requires a more extensive credit investigation. A large borrower also may be a large depositor. As a consequence, he may be given special attention and more time by the loan officers.

The rate of interest earned, Y_b, is included as an explanatory variable. This variable is the quotient of total income from business loans divided by the average business loans portfolio. It is a good measure of average yield, since the portfolio does not decline while interest income credited remains constant, as is the situation for instalment loans. The rate-of-interest-earned variable, Y_b, is expected to serve as a measure of the cost to a bank of administering risky loans and of providing extra services. A bank may "sell" the personal services of loan officers, more detailed loan account statements, etc., to customers by charging them a higher rate of interest on their loans. Or, a high interest rate may indicate the presence of a risk premium, added by the bank (or market conditions) because of the additional administrative costs, such as extensive credit checks and inventory audits of goods accepted as security for loans, incurred by the bank for customers who are relatively poor risks. A more direct and important cost of risk, defaults of principal and interest, is excluded from consideration since it is not a cost of operations.

"Total assets" (TA) was included as an explanatory variable to test for interdevelopmental cost effects. It reduced the variance of the dependent variable considerably (its partial correlation coefficient is .29 for the 1960 sample), but was highly collinear with the number-of-loans variable, N_b, and the average-loan-size variable, A_b (when TA entered the regression, the partial correlation coefficients of N_b and A_b dropped from .79 and .70, to .59 and .44). To adjust for this situation, the ratio of business loans-to-total loans and securities, in percentages (RB), was substituted for TA. This variable estimates the cross economies or diseconomies of scale, as does TA. Its inclusion in a multiple regression with N_b and A_b holds total business loans constant ($N_b \times A_b$ = total business loans, the numerator of RB), and its computed coefficient thus measures the effect of variations in total loans and securities (the denominator of RB).

The merger (M) annual rate of change of business loans as of December 31, 1956 through 1960 (RC_b), and variability of business loans as of December 31, 1956 through 1960 (V_b), variables were included in the 1960 regression only as follows:

$$\hat{E}_b = -4.122 + \underset{(.070)}{.809}\, N_b + \underset{(.089)}{.621}\, A_b + \underset{(.145)}{.474}\, A_r - \underset{(.115)}{.407}\, RB + \underset{(.272)}{.678}\, Y_b + \underset{(.355)}{.592}\, W - \underset{(.041)}{.107}\, RC_b + \underset{(.057)}{.101}\, V_b + \underset{(.068)}{.071}\, M$$

Table 15

Business Loans, 1959-1961, Annual Direct Expense (E_o)
(All Variables Are in Common Logarithms)

Independent Variables	Regression Coefficients (Standard Errors)		
	1959	1960	1961
N_b (number of loans)	.978 (.081)	.919 (.066)	1.006 (.084)
A_b (average balance of loans)	.740 (.086)	.810 (.073)	.851 (.096)
Y_b (interest yield earned on loans)	1.708 (.436)	.915 (.340)	.993 (.513)
W (relative wages)	1.007 (.338)	.560 (.288)	.540 (.366)
RB (ratio of business loans to total loans and investments, in %'s)	−.246 (.117)	−.301 (.112)	−.250 (.157)
Constant Term	−6.263	−4.489	−3.618
R^2	.7906	.8263	.7921
Standard Error of Estimate	.1600	.1537	.1811
In Antilogarithms: Mean of Dependent Variable	$13,730	$18,810	$20,710
Standard Error of Est. as Percentage of Mean of Dependent Variable	−30.8 and +44.5	−29.8 and +42.8	−34.1 and −51.7
Number of Observations	83	82	80

The variables are listed in the order that they entered the equations via the stepwise procedure (standard errors are given in the parentheses). The Student's t values of RC_b and V_b are 2.617 and 1.753, which are greater than the .007 and .05 levels (one-tail test). The two variables are somewhat competitive, since prior to the entry of RC_b into the regression, the coefficient (and standard error) of V_b was −.054 (.030), with a Student's t value of 1.815. Thus, it appears that banks that experienced greater positive rates of change of their loans had cost savings (or their loans increased more rapidly because they had lower costs), so long as the change was steady rather than fluctuating. Whether these savings are transitory or permanent cannot be ascertained from the data.

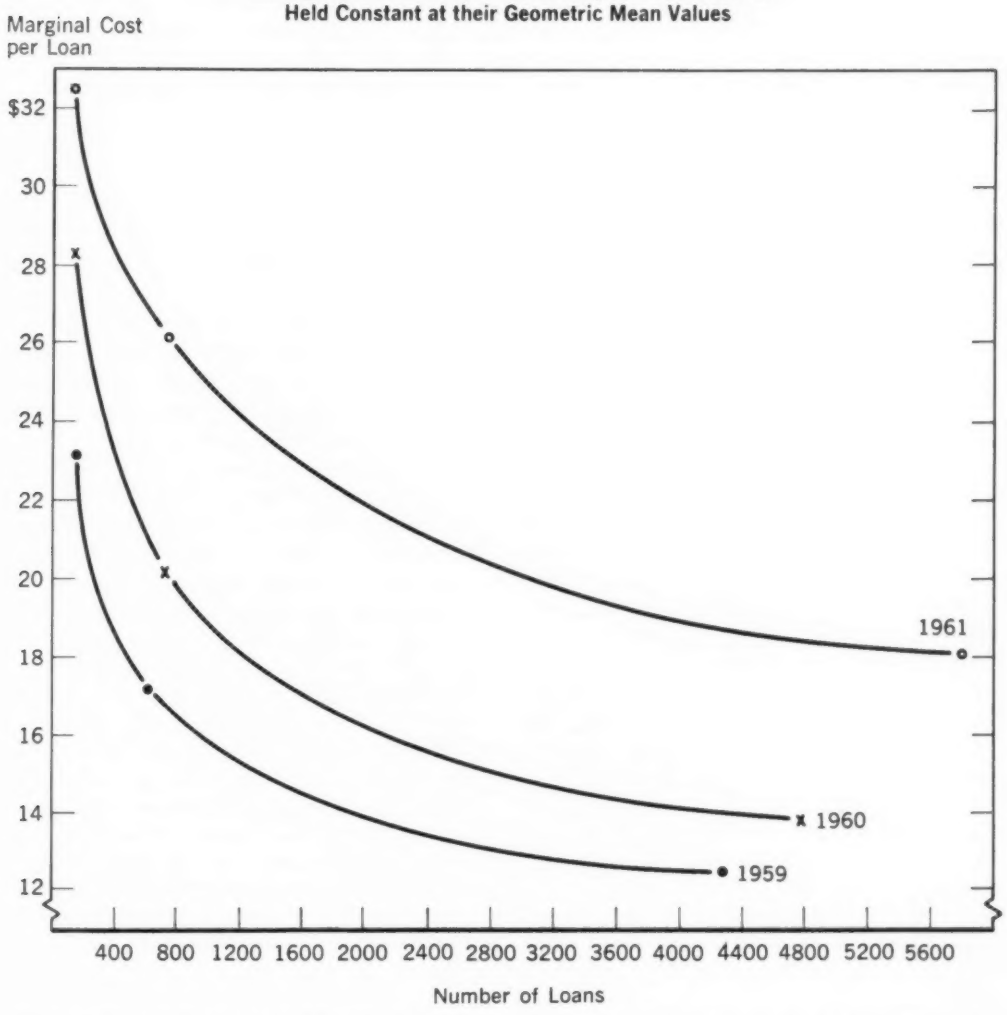
The average size of regular checking demand deposit accounts, A_r, was included as an explanatory variable to measure the cost a bank may incur in its business loans functions on behalf of customers with large checking accounts, in lieu of interest payments on these accounts. The variable was "significant," but collinear with A_b. Therefore, it is omitted from the regressions reported below.

The various forms of the branch banking variables (NO, B_0, B_1, B_2, B_3, B_4 and B_5) were tried, but none had coefficients larger than their standard errors. Indeed, in most instances, their standard errors were several times larger than their coefficients.

The regressions computed are presented in Table 15.

Chart 5

Business Loans, Marginal Annual Direct Cost per Loan, Average Size of Loan Allowed to Vary, Other Variables Held Constant at their Geometric Mean Values



Economies of Scale and Marginal Costs. The elasticity of direct costs with respect to the number of loans (N_b) is given by the coefficient of N_b in Table 15. There do not appear to be either economies or diseconomies of scale of much magnitude. However, it is important to note that the average size of loans (A_b) is a much more important explanatory variable here than were its counterparts in the other bank service regressions (such as instalment loans). With direct expenses (E_b) regressed on N_b only, the R^2 for the 1959, 1960, and 1961 regressions were .4169, .4215, and .4387. But with direct expenses (E_b) regressed on N_b and A_b, the R^2's increased to .6987, .7799, and .7658. Thus, it appears that banks with larger average loan balances did experience significantly higher costs. However, looking only at the coefficient of A_b, it appears that there

are economies of scale in handling these larger average loan balances. One can conclude, then, that both the number and average balance of loans are important determinants of direct operations costs, but that only the average balance is subject to economies of scale.

The earnings-yield-on-loans variable, Y_b, was also an important explanatory variable. Evidently, the banks did incur additional costs for customers who paid higher interest rates, or charged higher interest where additional services were required, as was hypothesized. However, the relationship was not stable. This instability might have been expected, since conditions of supply and demand for funds may have a large effect on interest rates but not affect the direct operations costs of lending. Also, the magnitudes are such that higher yields cause much greater increases in income than in operations cost. [29]

The ratio of business loans-to-total loans and securities, RB, was also an important explanatory variable. Since the number and size of the loans were included in the regressions, they serve to hold total business loans constant; the variation of RB is due to variation in total loans and securities. The negative coefficient of this variable, then, measures the effect of diseconomies of scale due to the over-all size of the banks. However, the larger banks tend to have more loans and, more important, larger-sized loans (the simple correlation coefficient of total assets with number of loans was .545, and with average loan size was .609, in 1960). Hence, the over-all diseconomies of the larger banks may be offset by their being able to secure larger loans.

For the marginal cost estimates, it is important to note that two variables are of great importance for business loans—the number of loans (N_b) and the average balance of loans (A_b). Since the number of loans (N_b) and average loan balances (A_b) were "significantly" negatively correlated ($-.210$ in 1959, $-.153$ in 1960, and $-.210$ in 1961), marginal cost was computed for a unit change in the number of loans with the average loan balances allowed to vary. [30]

The secular increase in level of the marginal cost curves is similar to that shown for instalment loans, mortgage loans and, to a lesser extent, time deposits. These banking services have not benefited from the increased mechanization that the demand deposit service has experienced. Thus, one might tentatively identify a trend of increased banking costs where savings, because of mechanization, are not available.

X. *Securities*

The securities activity includes the operations of a bank in buying, selling, and maintaining its portfolio of U. S. Government, municipal, and industrial bonds. The sampled banks had, on the average, a larger porportion of their total loans and securities invested in these

[29] The geometric means of direct cost and income per thousand dollars of loans are as follows:

Year	Cost per thousand	Income per thousand
1959	7.11	52.76
1960	6.66	53.48
1961	6.63	52.05

[30] Marginal cost is computed from the total direct cost function, $\hat{E} = a\, N^c\, A^g\, Y^h\, W^j\, RB^k$, where the lower case letters refer to the regression coefficients, and the constant term and the variables are stated in antilogarithms.

The derivative of total direct cost with respect to N, with variables other than A held constant at their geometric mean values (denoted by the bars), is:

$$\frac{\partial E}{\partial N} = c\, a\, N^{c-1}\, \bar{A}^g\, \bar{Y}^h\, \bar{W}^j\, \bar{RB}^k + \frac{\partial A}{\partial N} \cdot g\, a\, N^c\, \bar{A}^{g-1}\, \bar{Y}^h\, \bar{W}^j\, \bar{RB}^k$$

Table 16

Business Loans, Marginal Annual Direct Cost per Loan (Average Loan Balance Allowed to Vary, Other Variables Held Constant at their Geometric Mean Values)

Year	Minimum Number		Geometric Mean		Maximum Number	
	At No. of Loans	Marginal Cost	At No. of Loans	Marginal Cost	At No. of Loans	Marginal Cost
1959	153	$23.15	633	$17.77	4,279	$12.49
1960	150	28.28	748	20.11	4,793	13.87
1961	144	32.47	742	26.08	5,813	18.04

securities than in mortgage loans, instalment loans, or business loans, separately. The percentage of loans and investments held in securities ranged from 18 to 59, with 70 percent of the banks in the 30 to 50 percent range.

Conversely, the direct expense of this activity is much smaller than the direct expense of the other services. Almost all of the expense is payroll costs. (Interest on borrowed money, a direct expense that often is charged to the securities activity, is not included as an expense for this study since it is not a cost of operations, nor is it necessarily related to investments.) In many of the smaller banks, managing the securities portfolio is a part-time job. Consequently, the geometric mean of total direct expense, including supplies, information services, etc., is approximately $2,300, less than the salary of a full-time employee. Because the dependent variable was determined in banks entirely by allocations, it is subject to greater inaccuracy than those in other categories.

Another source of difficulty for fitting equations is defining output and matching the variable chosen to cost incurrences. While the efforts of the lower-paid clerical personnel are directed towards the flow of paper work through the securities department, the more highly-paid analysts are concerned with market conditions. Income from securities is not a useful output variable, since capital gains are just as important and are not necessarily related to income. However, the year in which a bank records capital gains on its books depends on its tax position and on current market conditions, neither of which is necessarily related to the time spent by investment analysts in a particular year.[31] An additional matching problem arises because the salaries paid to investment officers probably reflect their services over a period longer than a year. Given these difficulties, the securities regressions are not expected to be as accurate or useful as the other regressions.

The total securities portfolio (TS) was chosen as the major output variable, since data on the actual number of securities are not available. However, the amount of paper work processed may be related to the value of the securities portfolio. This variable also may estimate the cost of higher salaries paid to investment analysts who are responsible for larger portfolios. The ratio of United States Government securities to total securities (US) was included to test for possible costs or cost savings due to investment in these securities. Since the U. S. Government's market is highly organized, it may be that banks can process this type

[31] The yield on securities was included in the 1961 regressions to test this conclusion. Its coefficient was .743 and the standard error of the coefficient was .846.

Table 17

Securities, 1959-1961, Annual Direct Expense (E_s)
(All Variables Are in Common Logarithms)

Independent Variables*	Direct Expense (E_s)		
	1959	1960	1961
TS (total securities portfolio)	.938 (.169)	.704 (.166)	.567 (.109)
US (ratio of U. S. Government securities to total securities, in %'s)	−1.456 (.531)	−.820 (.492)	1.034 (.484)
RS (ratio of total securities to total loans and investments)		1.141 (.917)	
B_1 (1 for one branch, 0 for other than one branch)			−.143 (.092)
B_2 (1 for two branches, 0 for other than two branches)	−.219 (.118)	−.224 (.125)	
B_3 (1 for three branches, 0 for other than three branches)	−.217 (.170)		.170 (.112)
B_4 (1 for four branches, 0 for other than four branches)	−.390 (.228)	−.419 (.231)	.231 (.161)
B_5 (1 for five or more branches, 0 for other than five or more branches)		−.283 (.192)	
W (relative wages)		1.060 (.863)	
Constant Term	−.052	−3.412	−2.330
R^2	.3331	.3052	.4234
Standard Error of Estimate	.3757	.3835	.2958
In Antilogarithms: Mean of Dependent Variable	$2,146	$2,526	$2,401
Standard Error of Est. as percentage of Mean of Dependent Variable	−57.1 and +137.5	−58.7 and +141.8	−49.4 and +97.6
Number of Observations	83	82	79

* The variables reported are those whose regression coefficients are larger than the standard errors of the coefficients.

of security at a lower cost than others. Finally, the ratio of securities-to-total loans and securities (RS) was included to allow for possible inter-relationships between the securities department and the other banking departments.

Of the branch banking variables, the number of branches matrix dummy variables (B_1 through B_5) were found best in reducing the variance of the dependent variable. The merger variable (M) was used only in the 1960 regression, since its coefficient was considerably smaller than the standard error of the coefficient. The rate of change and variability variables (RC and V), used in the regressions for the other banking activities, were not used for the investments regressions. The

difficulty in gathering the data and making the computations for these variables did not justify the possible value expected of them, since the problems of fitting satisfactory regressions were so great. The regressions are presented in Table 17.

Unlike the other cost functions presented thus far, the underlying relationships for securities over the three years sampled were not stable, although the coefficients estimated were, on the whole, considerably larger than their standard errors. These shifts may have occurred because the part-time nature of the investment activity for most of the banks facilitated a shifting of effort to or away from investment analysis, as market conditions dictated. Hence, the change of the coefficient of the ratio of United States Government securities-to-total securities (RS) from negative in 1959 and 1960, to positive in 1961, may have been caused by differences in market conditions or some other factor not included in the regressions. However, despite the instability of some of the coefficients, a few generalizations can be made.

Economies of Scale and Marginal Costs. The major output variable, total securities (TS), appears subject to economies of scale, as one might expect. The elasticities with respect to direct cost are .938 in 1959, .704 in 1960, and .567 in 1961. However, these elasticities are not nearly as low as expected, since it is assumed, generally, that it costs little more to process a large portfolio than a small one. Apparently, larger portfolios bring greater responsibilities, and greater responsibilities carry higher salaries or other costs.

The marginal cost of handling $1,000 of securities differs considerably for the three cross-sections, as Table 18 shows. However, given the problems with the data and the specification of the variables, little confidence should be placed in these results. In any event, the marginal direct cost of securities is very small.

Table 18

Investments, Marginal Annual Direct Cost per $1,000 of Securities (Other Variables Held Constant at their Geometric Mean Values)

Year	Marginal Cost at Geometric Mean
1959	$1.021
1960	.279
1961	.324

XI. *Indirect Expenses*

Indirect expenses average 43 percent of total operating expenses. Such a large proportion of operating expenses requires analysis, even though specification of the explanatory variables cannot be as good as for the direct expenses. It would be best, for marginal cost measurement, to use the number of accounts and loans as the output variables. This was tried with predictable results. Multicollinearity among the number of demand deposit accounts, business loans, mortgage loans, etc., made reliable estimation of the regression coefficients impossible.

Since indirect expenses are related to the over-all activity of banks, "total assets" was used as the output variable.[32]

[32] "Total loans and securities" could have been used, but the results would have been equivalent since it is correlated +.99 with "total assets." As a test of the usefulness of "total assets" as a substitute for the number of accounts and loans, two regressions were computed—one with "total assets" and other independent variables (such as the branch banking dummy variables), and the second with the number of demand deposits, time deposits, mortgage loans, etc., and the same other independent variables. The standard errors of estimate of the regressions, and regression coefficients and standard errors of the coefficients of the other independent variables were almost the same for both regressions.

The following independent variables also were included in the regressions to account for differences in product mix:

D/TD = Ratio of demand deposits to total deposits, in percentages.

M/LS = Ratio of mortgage loans to total loans and securities, in percentages.[33]

I/LS = Ratio of instalment loans to total loans and securities, in percentages.[34]

B/LS = Ratio of business loans to total loans and securities, in percentages.[35]

S/LS = Ratio of securities to loans and securities, in percentages.[36]

In addition, the number-of-offices variable or branch-banking dummy variables were included to account for form of organization, and the merger dummy variable (M) to account for changes in organization. The annual rate of change of total assets (RC) and the variability of total assets (V) over the previous five years were included, but they were rejected for all of the regressions because their regression coefficients were less than the standard errors of the coefficients. All of the variables were converted to common logarithms, and the squares of the logarithms of the product-mix and total-assets variables were tried in the regressions. It is likely that all indirect expenses are not related in the same way to differences in "total assets" and other explanatory variables. Therefore, indirect expenses were divided into three categories: administration, business development, and occupancy expenses. Each was analyzed separately.

A. Indirect Administration Expenses

Approximately 27 percent of total operating expenses are indirect administration expenses. The salaries and fringe benefits of executive officers and the board of directors make up about 65 percent of this expense group. The balance includes general printing, office equipment rentals and depreciation, legal and other professional fees, examination and audit costs, and minor items.

The merger dummy variable (M) was of significant importance in explaining variations in this group of expenses, although it was not significant for business promotion or occupancy expense. Unfortunately, the data on mergers were available only for the 1960 sample. The regression on this sample computed with M is as follows:

$$\hat{E}_a = \underset{}{-5.205} + \underset{(.051)}{.907\,TA} + \underset{(.090)}{.228\,D/DT} + \underset{(.050)}{.164\,I/LS} + \underset{(1.895)}{3.936\,S/LS}$$

$$\underset{(.607)}{-1.266\,(S/LS)^2} + \underset{(.052)}{.074\,NO} + \underset{(.048)}{.125\,M}$$

$$R^2 = .9141$$

Standard error of estimate = .1009

The additional costs associated with mergers is $34,650, or 33 percent of indirect administration expenses. It is interesting to note that the cost of mergers appears to be reflected only in indirect administration expenses, although its effect there is significant.

Regressions of indirect administration

[33] All of the ratios of loans or securities-to-total loans and securities were not included in the same regression. B/LS usually was excluded.

[34] *Ibid.*

[35] *Ibid.* B/LS was not used in the same regression as D/TD since the two are highly correlated.

[36] See Footnote 33.

Table 19

Indirect Annual Administration Expenses (E_a)
(All Variables Are in Common Logarithms)

Independent Variables*	Regression Coefficients (Standard Errors)		
	1959	1960	1961
TA (total assets)	.995 (.051)	.916 (.052)	.997 (.076)
D/TD (demand deposit ÷ total deposits, in percentages)	.144 (.084)	.239 (.093)	.402 (.127)
I/LS (instalment loans ÷ total loans and securities, in percentages)	.123 (.050)	.169 (.052)	.121 (.079)
S/LS (securities ÷ total loans and securities, in percentages)	6.491 (2.576)	3.508 (1.958)	2.344 (2.085)
$(S/LS)^2$ (S/LS squared)	−2.059 (.799)	−1.135 (.627)	−.755 (.696)
NO (number of banking offices)	.056 (.054)	.114 (.051)	.049 (.074)
Constant Term	−7.665	−4.949	−4.949
R^2	.8835	.9063	.8332
Standard Error of Estimate	.1033	.1047	.1575
In Antilogarithms:			
Mean of dependent variable	$68,400	$87,100	$71,500
Standard Error of Est. as percentage of the Mean of the Dependent Variable	+26.8 and −22.6	+27.3 and −21.4	+43.7 and −30.3

* O/LS was not included in these regressions because of over identification and collinearity with D/TD. The variables reported are those that have regression coefficients that are larger than the standard errors of the coefficients.

expenses on the independent variables other than M were computed for the three cross-sections, and are presented in Table 19.

Economies of Scale and Marginal Costs. The elasticity of administrative expenses with respect to total assets can be read directly from the coefficients of TA. From their closeness to unity, it must be concluded that neither economies nor diseconomies of scale exist.

Because of the closeness of the regression coefficients of TA to unity, the marginal cost of change in TA is close to constant.[37] Hence, the marginal cost is not charted, but is given in Table 20.

B. Indirect Business Promotion Expenses

Indirect business promotion expenses are only 5 percent of total operating expenses. Approximately 68 percent of the business promotion expenses were for

[37] Only the 1960 sample provides a negatively sloped marginal cost curve, although the slope is not great. The marginal cost of a thousand dollar change in TA ranges from $7.38 at the geometric mean of TA less one standard deviation, to $6.56 at the mean plus one standard deviation.

Table 20

Indirect Administration Expenses, Annual Marginal Cost per Thousand Dollars of Total Assets (Other Variables Held Constant at their Geometric Mean Values)

Year	Marginal Cost at Geometric Mean
1959	$6.238
1960	6.950
1961	5.152

advertising and publicity, 22 percent for donations and gifts, and the balance for travel. Table 21 shows the significant explanatory variables.

Economies of Scale and Marginal Cost. The coefficients of TA are very close to unity, which leads to the conclusion that indirect business expenses are subject to neither economies nor diseconomies of scale with respect to total assets. It is interesting that none of the branch banking variables were significant, nor were the signs of the dummy variables consistent from sample to sample.

The marginal cost of a change in total assets is slightly negatively-sloped for the 1959 and 1960 samples, and slightly positively-sloped for the 1961 sample. Since the curves are almost flat, only Table 22 is presented.

C. Occupancy Expenses

Occupancy expenses are approximately 11 percent of total operating expenses, Depreciation, which probably is the most unreliable expense element of any cost study, is only 19 percent of occupancy expenses. The other expenses are building employees' salaries, real estate taxes, light, heat and water, insurance, etc. In-

Table 21

Indirect Annual Business Promotion Expenses (All Variables Are in Common Logarithms)

Independent Variables*	Regression Coefficients (Standard Errors)		
	1959	1960	1961
TA (total assets)	.965 (.077)	.989 (.053)	1.067 (.087)
B/LS (business loans ÷ total loans and securities, in percentages)	.327 (.097)	.243 (.085)	.352 (.165)
I/LS (instalment loans ÷ total loans and securities, in percentages)	.384 (.069)	.100 (.056)	
Constant Term	−3.609	−3.410	−4.183
R^2	.7477	.8389	.6921
Standard Error of Estimate	.1753	.1419	.2373
In Antilogarithms:			
Mean of the Dependent Variable	$11,430	$15,430	$8,630
Standard Error of Est. as percentage of the Mean of the Dependent Variable	+49.7 and −33.2	+38.6 and −27.9	+72.7 and −42.1

* The variables reported are those whose regression coefficients are larger than the standard errors of the coefficients.

come received from building rentals was deducted from these expanses. The regression coefficients computed are presented in Table 23.

Economies of Scale and Marginal Cost. Since TA^2 fit the data better than TA, the elasticity of occupancy cost with respect to total assets is not a constant and cannot be taken directly from Table 23. The elasticities of several values of TA are shown in Table 24.

Thus, the larger banks appear to suffer slight diseconomies of scale or, at least, lesser economies than smaller banks. However, the difference with respect to marginal cost is slight, as shown in Table 25.

XII. *Summary of Findings and Comparison with Previous Studies*

A. Economies of Scale

Economies of scale were found for all of the banking services analyzed. Table 26 summarizes these findings. The data shown are simple averages of the elasticities measured for the three samples. In general, the elasticities computed for each sample were quite similar.

The elasticities estimated for the number of deposit accounts or loans were less than, although in many cases close to, 1.0. However, these findings may be subject to downward bias due to the effect of possible joint movements of the banks' cost and demand curves. If the banks that produced greater output did so in part because they had lower than average marginal cost curves, the measured elasticities would include a downward bias. The existence of measurement errors in the independent variables (due to misspecification as well as errors in counting) would also contribute to a downward bias. Thus, it would be best to conclude that, while there are economies of scale of direct cost with respect to the number of deposit accounts or loans, these are not great: efficiency of operations is not largely a function of bank size.

In contrast to the close to unity elasticities of operations cost with respect to the number of deposit accounts or loans, the average elasticities with respect to the average balance of deposit accounts or loans were as follows:

Demand deposits	.44
Time deposits	.38
Instalment loans	.68
Business loans	.80

Consequently, had dollars of deposits or loans been used to measure output, economies of scale would have been found. But these apparent economies would have been the result of larger accounts or loans rather than the more efficient processing of these accounts or loans. Since larger banks serve customers with larger deposits and loan accounts than do smaller banks,[38] the net result would have have been an erroneous finding that economies of scale are a positive function of bank size.

Previous Studies. The findings of the present study should be compared with those of previous studies. Alhadeff[39] and Horvitz[40] analyzed the relationship between total operations cost, as a percent of loans and investments, and bank size. Bank size was measured in terms of five to nine size-classes of total deposits. Both Al-

[38] Edward P. Snyder, "Ownership of Demand Deposits," *Federal Reserve Bulletin*, XLVI, 1960, pp. 367-370; and James B. Eckert, Business Loans of Member Banks," *Federal Reserve Bulletin*, XLII, 1956, pp. 327-340.

[39] D. Alhadeff, *op. cit.*, Chapter VI, pp. 71-107, "Comparative Cost Patterns". Data from California banks for the years 1938 through 1950 were used.

[40] P. Horvitz, *op. cit.* Data from FDIC reports on all insured commercial banks for the years 1940 through 1960, except 1944, were used.

Table 22

Indirect Business Promotion Expenses, Annual Marginal Cost per Thousand Dollars of Total Assets (Other Variables Held Constant at their Geometric Mean Values)

Year	Marginal Cost at Geometric Mean
1959	1.005
1960	1.355
1961	.659

Table 24

Occupancy Expenses, Elasticities with Respect to Total Assets

Values of Total Assets (TA)	1959	1960
Mean less one standard deviation	.882	.955
Mean (geometric)	.915	.998
1960 Mean	.926	.998
Mean plus one standard deviation	.949	1.041

Table 23

Annual Occupancy Expenses (All Variables Are in Common Logarithms)

Independent Variables*	Regression Coefficients (Standard Errors) 1959	1960
TA^2 (total assets squared)	.065 (.005)	.070 (.005)
D/TD (demand deposits ÷ total deposits, in percentages)	.580 (.108)	.339 (.116)
I/LS (instalment loans ÷ total loans and securities, in percentages)	.068 (.053)	.098 (.055)
B_1 (1 for one branch, 0 for other than one branch)	.039 (.041)	.047 (.042)
B_2 (1 for two branches, 0 for other than two branches)	.082 (.044)	.084 (.048)
B_3 (1 for three branches, 0 for other than three branches)	.139 (.061)	.091 (.056)
B_4 (1 for four branches, 0 for other than four branches)	.336 (.083)	.260 (.085)
B_5 (1 for five or more branches, 0 for other than five or more branches)		.144 (.074)
Constant Term	.014	.206
R^2	.8558	.8855
Standard Error of Estimate	.1310	.1324
In Antilogarithms:		
Mean of Dependent Variable	$26,130	$34,760
Standard Error of Est. as percentage of the Mean of the Dependent Variable	+35.2 and −26.0	+35.6 and −26.3

* The variables reported are those whose regression coefficients are larger than the standard errors of the coefficients. B/LS was not included in the regression because it is collinear with T/TD. Data for 1961 was not used because a change in reporting made it noncomparable with the other samples.

Table 25

Occupancy Expenses, Annual Marginal Cost Per Thousand Dollars of Total Assets (Other Variables Held Constant at Their Geometric Mean Values)

Values of Total Assets (TA)	1959	1960
Mean less one standard deviation	2.61	2.82
Mean (geometric)	2.56	2.90
1960 Mean	2.55	2.90
Mean plus one standard deviation	2.54	3.06

hadeff and Horvitz found that costs as a percent of loans and investments decline for banks with less than approximately $5 million of total deposits, remain fairly constant for banks holding between $5- and $25-to-$50 million in deposits (depending on the year), and then decline again for larger banks. The relationships were replicated for 12 to 19 years and found to be generally consistent.

Schweiger and McGee,[41] and Gramley[42] used multiple regression analysis on one sample each of data where the dependent variable was total operations cost as a percent of total assets.[43] The independent variable used in the two studies differed somewhat (as is detailed below), although "total assets" was used in both studies as the major explanatory variable. Both studies reported that costs per thousand dollars of total assets (called "unit costs" hereafter) decline considerably at a decreasing rate until banks with total assets of approximately $50 million are reached, after which the decline continues, but at a reduced rate.

Thus, the conclusions of the two pairs of studies, as well as their methods of analysis, differ. All of the studies indicated relatively high unit costs for the smallest banks. But the Alhadeff and Horvitz studies showed approximately constant unit costs for middle range banks ($5-to-$50) million in deposits, and lower unit costs for large banks (those having over $50 million in deposits). Conversely, the Schweiger-McGee and Gramley studies showed reductions in unit costs as bank size increased for the middle range, and much smaller reductions over the range of large banks. As a further comparison, my study of middle-range banks shows slight economies of scale, with "scale" measured by the number of deposit accounts and loans rather than total assets or deposits.

It is difficult to resolve the somewhat diverse findings of these studies because of the different methods of analysis used.[44] Alhadeff's data are particularly hard to analyze because differences in product-mix among different sized banks were not accounted for. Thus, one cannot determine whether the small banks had

[41] I. Schweiger and J. S. McGee, *op. cit.*, pp. 323-329. Data for 1959 for all member banks were used.

[42] L. E. Gramley, *op. cit.* An approximately random sample of 270 member banks in the Tenth Federal Reserve District was taken. Annual ratios for the years 1956 through 1959 of the variables analyzed were averaged to produce a single sample.

[43] Schweiger and McGee accounted for curvilinearity by sub-dividing their data into three sub-samples of banks with less than $50 million, with $50-to-$200 million, and with over $200 million in deposits, and by computing regression coefficients for each. Gramley transformed his major scale variable, total assets, to logarithms since tests indicated curvilinearity in his data. He described tests which indicated that the transformed variable accounted for the curvilinearity. Schweiger and McGee do not discuss this problem. None of the authors indicate any problems with heteroskedasticity, probably because their use of ratio data achieved homoskedasticity.

[44] The criticisms of these studies are made with respect to the data rather than the methods used and conclusions reached by the authors. Given the limited data they had available, they generally did all that could be done.

Table 26

Elasticities of Scale (Mean of 1959, 1960 and 1961 Samples)

Banking Service	Elasticity of Direct Expenses with Respect to the No. of Accts. or Loans	Type of Indirect Expense	Elasticity of Indirect Expenses with Respect to Total Assets
Demand Deposits	.878	Administrative	.969
Time Deposits	.846	Business Promotion	1.007
Mortgage Loans	.907	Occupancy	.962
Instalment Loans	.880		
Business Loans	.968		
Securities ($ securities)	.736		

higher average unit costs and the large banks lower average unit costs, because these two classes of banks performed different services or because the large banks did the same things more efficiently.

Horvitz provides supplementary data for 1959 that helps account for some differences in product-mix. He separated the banks into those that held less than 25 percent, 28 to 50 percent, and over 50 percent of time deposits. Data for unit banks and branch banks are given separately by accounting for broad differences in deposit structure in this manner. Horvitz shows that only very large banks (those holding over $100 million in deposits) with less than 25 percent time deposits experienced lower unit costs than did smaller banks. These large banks also had greater dollar holdings of loans than investments per thousand dollars of loans and investments; but they also had a greater percentage of business loans than real estate or instalment loans. This association of product-mix and bank-size may account for the divergent findings of Alhadeff-Horvitz and Schweiger and McGee-Gramley with respect to large banks. Analysis of Horvitz's 1959 data reveals that the proportion of business loans-to-total loans held and unit costs are inversely related. It appears that if the proportion of business loans-to-total loans were accounted for (as in the Schweiger and McGee, and Gramley studies), the sharp reduction in unit costs for very large banks would not have been found.

Schweiger and McGee, and Gramley attempted to account for factors other than the scale of operations by using multiple regression analysis. They both included such variables as the ratios of time-to-total deposits, and consumer loans-to-total assets or total loans. In addition, Schweiger and McGee used the ratios of business loans-to-total assets and farm loans-to-total assets, the percentage growth of population in each bank's state, and dummy variables for community size and branch and unit banking. Gramley included the ratios of total loans-to-total assets, and other than Government securities-to-total assets, and the percentage growth of total assets from 1956 through 1959, as additional independent variables in his regression. (There are no branch banks in Gramley's sample.)

This procedure is certainly an improvement over Alhadeff's and Horvitz's analysis. However, two important difficulties remain, difficulties that are also common to the Alhadeff and Horvitz studies. By using costs per dollar of total assets (unit costs) as the dependent variable, and

total assets or deposits as the major independent variable, they imparted a negative bias to the coefficient of total assets. This somewhat obscures their findings of economies of scale.

Of much greater importance, however, is the use of *dollars* of deposits and earning assets to measure operations efficiency. My study indicated that for most banking services (all except business loans), the number of deposit accounts and loans explained much more of the variance in operations costs than did the average size of deposit accounts or loans.[45] Since dollars of deposits and assets were used in the other four studies to measure output, it is not surprising that what appeared to be "economies-of-scale" were found. But we should not conclude that large banks are more efficient than small banks, anymore than one would decide that wholesalers are more efficient than retailers because they have lower costs per dollar of sales.

Nevertheless, Schweiger and McGee's study can be used to check the applicability of the present study, which is considerably more detailed but also more limited in sample size and coverage than theirs. The variables of the 1959 sample of the present study were recast in a form similar to that used by Schweiger and McGee. The regression coefficients computed are compared in Table 27 with those they report.

Schweiger and McGee's finding of small and not "significant" "economies-of-scale" with respect to total deposits for banks over $50 million of total assets leaves us with something of a puzzle. If operations economies are negligibly related to scale, and if large banks have larger average deposit accounts and loans than do small banks, it would seem that Schweiger and McGee should have found "economies-of-scale" for the large banks.

Does this mean that large banks actually experience diseconomies of scale with respect to operations costs?[46] Or, would replication of the regression reveal lower unit costs for large banks? It is important to answer this question if one is to apply the findings of these recent studies to policy questions. At this juncture, however, one can only ask that further research be undertaken.

B. Marginal Costs

Annual direct marginal costs were estimated for the average number of demand and time deposit accounts and the number of mortgage, instalment, and business loans processed. The curves that were plotted for each of the three years were generally very similar. Table 28, which summarizes the data, presents the arithmetic average of annual marginal direct cost per account or loan at the geometric means of the number of accounts or loans, and the annual indirect cost per thousand dollars of total assets.

The demand deposit marginal cost curves are downward-sloping while the time deposit marginal cost curves are fairly flat after the geometric mean number of accounts is reached. The 1961 time deposit curve even turns upwards slightly. These findings are consistent with the general observation that larger banks hold proportionately more demand

[45] The proportion of the variance "explained" by the number of deposit accounts or loans ranged from a high of from .85 to .90 for demand deposits, to a low of .65 to .76 for mortgage loans. Inclusion of the average size of accounts or loans raised the R^2's by only about .05. However, the average size of loans was only slightly less important than the number of loans for the business loan service.

[46] The prohibition of interest payment on demand deposits may be an important factor. The large banks may be paying their large depositors interest on their deposits in the form of additional services. Thus, for these larger banks, size of account may be a more important determinant of operations cost than for medium-sized banks. I am exploring this hypothesis in another paper now in preparation, "The Effectiveness and Effect of the Prohibition of Interest Payments on Demand Deposits."

Table 27

Total Operating Expenses per $100,000 of Assets, Banks with Less Than $50 Million of Assets, 1959

Independent Variables	Regression Coefficients (Standard Errors)	
	Schweiger and McGee	Present Study
Total deposits, in millions	−13.83 (1.31)	−10.64 (6.09)
Branch (= 1), Unit (= 0)	234.71 (28.78)	188.10 (83.30)
Time/total deposits, percent	11.23 (.52)	11.23 (3.62)
Business loans/assets	20.10 (1.82)	9.71 (4.61)
Consumer loans/ assets	49.61 (1.76)	11.66 (7.60)
Farm loans/assets	12.27 (1.12)	
Mortgage loans/assets		43.75 (4.68)
State population increase, percent	3.18 (.75)	
Community (1 = small to 4 = large)	−93.13 (10.41)	
Relative wages		1228.34 (773.81)
R^2	.25	.66
Number of observations	5,788	83
Scope of sample	All member banks	Sample of First Fed. Reserve District member banks

than time deposits, although it is likely that other factors than marginal costs are more important determinants of deposit structure.

The 1960 and 1961 mortgage loan curves slope upwards at a decreasing rate, although the 1959 curve is flat. The instalment loan curves are consistently U-shaped, and the business loan curves are rather sharply downward-sloped when the effect of simultaneous changes in the average size of loans is taken into account. These findings are also consistent with the observation reported by Horvitz that for larger banks the proportion of real estate and instalment loans-to-total loans and investments is lower, and the proportion of business loans-to-total loans and investments is higher than for smaller banks.[47] No doubt, institutional and market considerations

[47] Horvitz, *op. cit.*, Tables 1-6 through I-II, pp. 28-33.

Table 28

Average Marginal Direct Cost per Unit Change in the Number of Deposit Accounts, Loans or Total Assets (Other Variables Held Constant at Their Geometric Means)

Banking Service	At Geometric Means		
	Per Account	Per Loan	Per Thousand Dollars of Total Assets
Demand Deposits	$20.64		
Time Deposits	1.78		
Mortgage Loans		$21.02	
Instalment Loans		12.15	
Business Loans		21.32	
Indirect Administration Expenses			6.11
Indirect Business Promotion Expenses			1.00
Occupancy Expenses			2.73

are also of great importance, as is the situation for the deposit structure of banks.

The marginal costs of the three types of indirect expenses are fairly constant. They are also quite small; however, since they average about $10 per thousand dollars of assets, they cannot be disregarded.

XIII. *The Relationship of the Present Study to the Problems of Cost Studies in General*

The properties of the data and the procedures used for this study may be compared favorably with the "ideal" conditions set forth by J. Johnston in his comprehensive work, *Statistical Cost Analysis.*[48] He lists four requirements: (1) the time unit to which individual observations relate should be short enough to avoid possible averaging effects; (2) the cost data should be directly related to the related output data; (3) there should be a wide spread of output observations in which, if a cross-section is used, the firms are fully adjusted to their measured outputs; and (4) the data must be uncontaminated by cost movements due to differences in factor prices, available technology, etc. In my opinion, these requirements were met by the present study as well as can be expected for data that arose from an actual, as opposed to an experimental, situation, except that it would have been desirable to include larger banks.

The institutional setting of the banking industry justifies the assumption required for cost studies that the data observed trace cost curves rather than successive intersections of cost and demand curves. Differences in output among banks can be ascribed primarily to demand conditions. Federal and/or State regulation and licensing of banks often create local monopolies or limit the size of the market a bank may service. This factor, together with the high cost of inconvenience to the customer in dealing with a bank that is far from his home or place

[48] J. Johnston, *Statistical Cost Analysis*, New York: McGraw-Hill, 1960.

of business, are much stronger determinants than cost conditions of the quantity of bank output.

Even with these basic conditions satisfied, critics have objected, on theoretical and empirical grounds, to the procedures used for cost studies. Johnston describes and discusses these criticisms in Chapter 6 of his book and dismisses several as theoretically invalid.[49] However, he admits that problems involving the treatment of capital costs, depreciation, output-mix, and a regression fallacy due to possible randomness of output may prove troublesome to the investigator. However, I believe that the present study overcomes these problems successfully.

The first problem, that of capital costs, was posed by Milton Friedman.[50] Friedman argues that differences in costs among firms derived from cross-section data merely give evidence of mistakes in the initial determination of optimal firm size, of historical changes in the optimal size of firms, or of imperfections in the capital markets. Johnston counters Friedman's first objection by pointing out that it is valid only for perfectly competitive markets and not for situations where the size of firms is determined by the distribution of demand.[51] As was pointed out above, the number of firms in the banking industry is determined by government regulatory agencies and institutional conditions. The output of banks, then, is not primarily a result of historical change or accident. Friedman's second contention is that cost should be defined as equal to receipts. As Johnston points out: "The theory of cost curves assumes that in costs we include only those payments necessary to secure the factor services required for the output in question.[52] The inclusion of economic rents and profits in costs, proposed by Friedman, would severely restrict the usefulness of the present study, since we wish to examine the costs of banking operations without regard to the market position of the banks sampled.

Second, inclusion in cost studies of accounting depreciation rather than user cost is a valid objection for many cost studies.[53] However, this problem did not plague the present study: depreciation is a very small part of direct expenses, because the banks included did not own much expensive equipment. Depreciation on bank buildings was allocated entirely to occupancy cost and therefore only affected that portion of the analysis.

Third, Johnston admits that: "Criticism has been justly directed against statistical studies of multiple-product firms, where an output index has been constructed to measure changes in the level of a diversified output range."[54] The procedure adopted here, of analyzing banking services separately, meets this objection as was discussed above. (This method is suggested by Johnston.)

A final criticism, which Johnston admits may be troublesome, is the regression fallacy possibility put forth by George Stigler.[55] Briefly, Stigler argues that a finding of economies of scale could be caused by transient changes which occurred in the year in which data was taken, while their costs remained at the expected amounts. Thus, if there were only two firms in a cross-section, each with the same planned costs and outputs, a random factor added to one firm's output and deducted from the other's would result in measured economies of scale. A test was made to judge if this possi-

[49] *Ibid., pp.* 169-194.

[50] Milton Friedman, "Comment," *Business Concentration and Price Policy,* Universities—National Bureau Committee for Economic Research, Princeton: Princeton University Press, 1955, pp. 23-38.

[51] Johnston, *op. cit.,* pp. 186-187.

[52] *Ibid.,* p. 187.

[53] *Ibid.,* pp. 183-185.

[54] *Ibid.,* p. 185.

[55] *Ibid.,* pp. 188-192; and George J. Stigler, *The Theory of Price,* rev. ed.; New York: The Macmillan Co., 1955, pp. 143-144.

bility could have contaminated the present study. Output for each banking service, and for the bank as a whole, for the banks in the 1960 cross-section was estimated by total demand deposits, time deposits, mortgage loans, instalment loans, business loans, and total assets as of December 31, for the five years 1956 through 1960. Each type of asset and liability was ranked in size order for each year. Rank correlations were constructed from these six sets of ranks.[56] It was assumed that a high rank correlation is evidence that the banks sampled did not experience transient changes in output. The coefficient of concordance, W, gives the degree of agreement of ranks: if they are unchanged from year to year, W = 1; if they change completely, W = 0. The coefficients of concordance computed were the following:

demand deposits	= .9912
time deposits	= .9812
mortgage loans	= .9776
instalment loans	= .9631
business loans	= .9674
total assets	= .9911

The assumption that the observations are statistically independent of each other and that the independent variables are statistically independent of random errors was tested by two procedures. First, the banks were ranked by total-asset size and plotted on a map of New England; no dependence could be discerned by any of several observers. Second, the population size of the metropolitan area, city, or village in which the bank was located was included as an independent variable in the 1960 cross-section regressions. The standard error of the coefficient of this variable was larger (often by several times) than the coefficient for all regressions except those of the securities department. The population variable was included in the 1959 and 1961 regressions for this department, but it was insignificant. Hence, dependence due to size of place apparently was not present. Therefore, while independence cannot be unequivocally asserted, there appears to be no obvious dependence present.

Thus, this study observes most of the requirements for statistical cost analyses. As such, it should contribute to the empirical literature on this subject as well as to our knowledge about the costs of banking operations.

[56] Maurice G. Kendall, *Rank Correlation Mehods*, London: C. Griffin, 1948, Chap. VI.

► HENRY N. GOLDSTEIN

The External Costs and Benefits of Recent Monetary Policy

I. *Introduction*

During the past few years, U.S. policy makers have resorted to a variety of techniques to cope with the dilemma of persistent internal slack and persistent external payments deficits. Among the most interesting policies adopted has been "Operation Twist"—the use of monetary and debt-management techniques to maintain (and even increase) short-term interest rates while limiting the upward movement of long-term rates. This policy has reflected two separate beliefs: first, that long-term rates impinge on domestic activity much more sharply than short-term rates; and, second, that the level of U.S. short-term rates, relative to rates abroad, is an important determinant of the net outflow of capital from the United States.[1] Accordingly, it is argued that "Operation Twist" has had only a negligible restrictive impact on our domestic economy, but has succeeded in dampening significantly the flow of capital to the rest of the world. In short, so the argument goes, this policy has yielded substantial *external* benefits at a slight *internal* economic cost.

This assessment of recent U.S. monetary policy fails to take proper account of its external costs. In this article, we shall attempt to evaluate these external costs and benefits. In the process, we shall consider some of the factual and theoretical aspects of covered interest arbitrage, and of flows of "uncovered

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I am indebted to Arthur B. Hersey, William Poole, and Robert Sammons for valuable comments and criticisms, but they should not be held responsible for my views.

[1] Of course, the authorities have also recognized that a relatively low level of U.S. long-term rates can generate a substantial outflow of capital; they have attempted to limit such long-term outflows through the Interest Equalization Tax.

funds" from the United States into the Euro-dollar market.

Professor H. Peter Gray has recently dealt with some of these issues,[2] and we shall use his analysis as a point of departure. Gray argues that the United States has been paying a high *external* price to reduce its net outflow of interest-sensitive, short-term funds. He contends that the higher level of U.S. short-term rates established in mid-1963 has not merely reduced U.S. residents' interest earnings on foreign investments because of lower net placements of funds abroad; it has also given foreigners additional interest earnings on both new and pre-existing holdings of money-market assets in the United States. (A higher return on the latter became effective as soon as such assets matured and were "rolled over" at higher yield levels.)

According to Gray, the "annual cost to the U.S. of the interest-induced capital movements" resulting from the higher U.S. short-term rates established in mid-1963 can be estimated by the formula:

$$C = Ir + Fd \qquad (1)$$

where C = increase in per annum interest payments to foreigners (in dollars);

I = volume of interest-induced, short-term capital movements (in dollars);[3]

F = volume of short-term claims held by foreigners prior to the interest-rate increase (in dollars);

r = average rate of return paid on newly attracted funds (in percent per annum terms);

d = difference between the old and the new average rate of return paid on F (in percent per annum).

This marginal annual cost can be expressed as a percentage of the net induced capital inflow simply by dividing equation (1) by I:

$$\frac{C}{I} = \frac{Ir + Fd}{I} \qquad (2)$$

In using this equation to estimate C/I for the year following July 1963, Gray assumed:

(1) that the ½ of one percent increase in the System's discount rate in July 1963 would continue until July 1964 (which it did);

(2) that d attained its "full value" instantaneously[4] (though obviously contrary to fact, this simplification does not bias his estimate significantly since most

[2] "Marginal Cost of Hot Money," *Journal of Political Economy*, LXXII, April 1964, pp. 189-192. Gray uses the phrase "hot money" to refer to funds that move from country to country to take advantage of short-term interest rate differentials, not funds that move because of expectations of possible changes in par values or the imposition of exchange controls. We shall follow his usage, even though it seems clearer to restrict the use of the phrase, "hot money", to denote funds that move for speculative rather than interest-rate considerations.

[3] Gray defines these movements as the *sum* of interest-induced, asset-acquisitions in the United States by foreigners, and of interest-induced, non-acquisitions (or liquidations) of assets owned abroad by U.S. residents. In other words, "I" measures the effect of interest-rate changes (a) on net private foreign resident claims on the United States (we assume official foreign balances to be interest-insensitive), and (b) on net private U.S. resident claims on foreigners. Thus, "I" is really the sum of two related categories of capital flows and "non-flows". As Gray points out, both flows have similar effects on the U.S. current account: increased foreign holdings of U.S. assets require increased interest payments to foreign residents; smaller U.S. resident holdings of foreign assets reduce interest earnings from abroad. Following Gray, we will simply refer to "I" as the interest-induced private capital *inflow*, but this "inflow" should be understood to include the *reduced outflow* of U.S. resident funds caused by higher U.S. interest rates.

[4] Gray seems to imply that U.S. short-term yields rose in a single spurt following the in-

foreign-held dollar holdings have maturities of less than three months);

(3) that the System's discount-rate action was followed by an increase in time-deposit earnings by foreign depositors of 0.25 percent and by increased yields on other foreign-held interest-yielding assets of 0.5 percent.[5]

On the basis of Secretary Dillon's statement before the Joint Economic Committee on July 8, 1963, Gray assumed that the tightening in U. S. monetary policy in mid-1963 would generate an induced short-term capital inflow from mid-1963 to mid-1964 (or reduction in net capital outflow) of $1 billion. He further assumed that the interest rate paid to attract this inflow (or the interest rate foregone by U.S. residents who kept their funds at home) averaged 3.5 percent. Thus, he evaluated equation (2) as:

$$\frac{C}{I} = \frac{(0.035)\,(1{,}000) + 66}{1{,}000} = \frac{35 + 66}{1{,}000} = 10.1 \text{ percent.}$$

Given Gray's straightforward view of interest-arbitrage relationships, this 10.1 percent estimate seems quite conservative.[6]

Gray, however, overlooks a number of important "institutional complications". We shall describe these additional considerations, estimate their importance, and make some revised estimates of C/I. We also estimate a new variable—"the marginal cost of reducing foreign official gold and dollar holdings" by a tighter U.S. monetary policy—a variable that seems more relevant for policy-makers than C/I. Finally, we consider complications that arise because of the reaction of exchange markets to changes in interest-rate differentials and because of the structure of the Euro-dollar market.

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crease in discount rates from 3 to 3½ percent at seven Federal Reserve Banks on July 17, 1963. In fact, the 3-months Treasury bill rate had risen by ¼ of one percentage point in the three weeks preceding the discount rate increases and the rate continued to rise until late October. Commercial paper rates followed the same pattern. Thus, the increase in System discount rates in mid-July should be viewed as something less than *the* causative variable pushing up market interest rates. Obviously, many other factors were also impinging on market rates: e.g., the net reserve effect of System open market operations; the market's demand for funds (including Treasury borrowings); the increase in legal ceilings on time deposit rates under Regulation Q; and a host of expectational influences.

[5] Official figures showed foreigners holding $4.3 billion of U.S. time deposits and $11.1 billion of short-term U.S. governments and other interest-earning dollar claims shortly before the discount-rate action. Accordingly, Gray estimated in Fd in equation (2) to be $66 million:

.0025 × $4.3 billion =	$10.8 million
.005 × $11.1 billion =	55.5 million
	$66.3 million

[6] Gray points out:

(1) That Dillon's $1 billlion estimate was likely to exceed the true inflow because foreign interest rates would probably rise in reaction to the U.S. discount rate, reducing the net incentive for a capital inflow. Therefore, 10.1 percent would understate the true marginal cost of interest-induced, short-term capital inflows. (Higher foreign short-term rates would also increase the interest earnings of U.S. residents having short-term investments abroad, but this would be a minor offset since these investments are relatively small.)

(2) That the rise in the structure of U.S. interest rates was bound to be uneven, and that foreign dollar holders would tend to alter the *composition* of their dollar holdings in favor of those short-term instruments showing larger yield increases. This implies that the $66 million estimate for Fd has a downward bias.

(3) That there was likely to be some resulting rise in the entire yield curve. Therefore, foreigners holding U.S. securities maturing in more than one year would receive larger interest payments in succeeding years when these securities matured (assuming that the yield curve still remained at a higher level than would otherwise be the case).

II. *Interest-sensitive Private Balances, Foreign Official Dollar Holdings, and Private Speculative Balances*

Gray has implicitly assumed that an interest-induced inflow of private foreign funds does not affect the balance of short-term, interest-earning dollar claims held by foreign official institutions, and that it also does not affect the size of private "speculative" balances in non-dollar currencies. Hence, in computing the "marginal cost of hot money", he simply multiplies the increment in private interest-sensitive balances, I, by the new higher interest rate, r, and to this product adds Fd, the incremental interest paid on all foreign balances held in the United States prior to the rise in short-term U.S. interest rates. This procedure seems illlegitimate. Some of the balances held by foreign official institutions prior to the discount rate action will be liquidated *as a result of* the interest-induced private capital inflow. Moreover, to the extent that foreign central banks allow the exchange rate for their currencies to weaken, there will also be a rise in private "speculative" outflows from the United States. Since these outflows imply either smaller non-resident holdings of interest-earning assets in this country, or larger U.S. resident holdings of interest-earning assets abroad, they represent another offset to the "marginal cost" estimate made by Gray.

Suppose, for example, that an increase in U.S. short-term interest rates leads interest arbitragers to maintain larger holdings of short-term U.S. Treasury bills and smaller holdings of money-market paper in London. This shift in foreign private portfolios would tend to weaken sterling in the spot exchange market and—if the capital inflow were covered—to strengthen it in the forward market.

Who would supply the spot dollars sought by the interest arbitragers? There are only two possibilities—it must be either the Bank of England or private transactors who become willing to acquire additional spot sterling when it becomes sufficiently cheap.[7] We shall call these transactors "speculators", even though they may have acquired the "low-priced" sterling for purposes other than direct resale at a later higher price; for example, they may use it to pay for imports or to make portfolio or direct investments in the sterling area.

If interest arbitrage inflows to the U.S. are "covered" and the forward rate for sterling is permitted to strengthen because the authorities refrain from intervening in the forward market, the forward sterling sought by interest arbitragers must be completely supplied by private market participants. These persons may have a similar variety of uses for cheap forward dollars; and their purchases of forward dollars (sales of forward sterling) may also be viewed as "speculative" since they would not have occurred if the rate on forward sterling had not risen.[8]

With these considerations in mind, we can formulate an amended version of Gray's equation (1). The additional per annum cost of attracting I dollars of inter-

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[7] We assume that the U.S. authorities do not intervene in spot exchange markets for their own account, an assumption which corresponds closely to the known facts.

[8] Whether the U.S. current account will weaken or strengthen when spot and forward rates move in divergent directions is an interesting but complicated question. Some exporters and importers may always cover through the forward market; others may never cover (e.g. tourists); still others may "play the rates," covering forward when foreign currencies are at a forward discount but not covering when they are at a premium. But, even if one knew which set of rates "mattered" to which importers and exporters, one would still have to estimate the price elasticities of domestic and foreign import demand to determine the net current-account impact when spot and forward rates moved in opposite directions. And this impact would vary for different periods of adjustment.

est-sensitive private funds from abroad will equal:

(1) the interest paid on these new claims (at a rate r);

(2) *plus* the increased interest paid on that part of previously-held foreign claims that are still held after the shift in private portfolios (the increment in the interest rate being denoted by d);

(3) *less* the interest no longer paid on foreign central-bank dollar assets (at a rate $r - d$) which have been liquidated so that the banks could acquire spot dollars to intervene in the exchange market;

(4) *less* the interest no longer paid on the dollar assets of private foreign "speculators" (at a rate of $r - d$) who have shifted into foreign currencies as their prices cheapened in the exchange market;

(5) *less* the interest now earned on foreign-currency assets acquired by private U.S.-resident "speculators" who have also shifted into foreign currencies. (To simplify matters we will assume the applicable average yield here is also $r - d$.)

We may express the amount of interest-earning dollar assets liquidated by foreign central banks as some fraction of the interest-induced private capital inflow, i.e., as kI where $o < k < 1$. Similarly, we may express the amount of dollar assets liquidated by private speculators (who respond to a weakening of the spot rate for foreign exchange) as pI where $o < p < 1$. If foreign central banks do not liquidate any gold and maintain their dollar demand deposits at minimal levels, $p + k = 1$. Otherwise, $p + k < 1$. (As a general rule we may expect the latter relationship to hold.)

Accordingly, we may write the incremental interest cost of attracting an inflow of private capital of amount I as:

$C = Ir + (F - kI - pI)\,d - kI\,(r - d) - pI\,(r - d)$ which simplifies to:

$$C = Ir\,(1 - k - p) + Fd \qquad (3)$$

Dividing by I to get the "marginal cost of hot money" gives:

$$\frac{C}{I} = \frac{Ir\,(1 - k - p) + Fd}{I} \qquad (4)$$

As we have just noted, however, $(k + p)$ I differs from I only by that portion of foreign official dollar sales which are "financed" by a reduction in foreign official gold stocks. We may denote this last quantity by gI (where $1 \leq g \leq o$ and where, obviously, $k + g + p = 1$). Thus, we may rewrite equation (4) as:

$$\frac{C}{I} = \frac{g\,Ir + Fd}{I} \qquad (5)$$

Once some estimate or assumption of the value of g is made, this expression can be evaluated and compared with Gray's evaluation of equation (2). If we stick to Gray's assumptions regarding reasonable values of I, r, F and d, we obtain the following results for five sample values of g:

g	C/I
0.0	6.6%
0.1	7.0%
0.2	7.3%
0.5	8.4%
1.0	10.1%

III. *The Marginal Cost of Reducing Foreign Official Reserve Holdings*

Except in the extreme case where the exchange rate is rigidly pegged by foreign central banks who finance their dollar disbursements to the exchange market exclusively by selling gold to the U.S. Treasury, our estimates of "the marginal cost of hot money" are lower than Gray's. For we have taken account of two feedback effects: (1) that an interest-induced capital inflow would normally lead foreign central banks to liquidate a certain amount of interest-earning dollar assets; and (2) that it will also induce a speculative private capital outflow. Nevertheless, our results seem unsatisfactory. Reflection suggests that the "marginal cost of hot money" is not (or *should* not be) a matter of great concern to U.S. policy-makers.

Rather, their concern centers (or *should* center) on the cost of using a tighter-money policy to reduce foreign official reserve holdings. For it is only a reduction in the gold and dollar holdings of foreign official institutions that represents an improvement in the U.S. balance of payments in the critical "exchange-market" sense,[9] and that corresponds to an improvement in the liquidity position of the United States vis-a-vis foreign official institutions.[10]

We may let R stand for the reduction in foreign official reserves stemming from the "proximate effects"[11] of monetary-tightening in the United States. Since R must be the sum of the change in foreign official dollar assets and gold holdings, we have:

$$R = kI + gI = (g + k)I$$

The relevant marginal cost of a given reduction in R, therefore, is:

$$\frac{C}{R} = \frac{gIr + Fd}{(k + g)I} \qquad (6)$$

Depending on a number of considerations, k and g could each have a range of (positive) fractional values. Their sum, however, must lie between zero and one. For, by definition, (k + g)I equals the change in foreign official reserves that results from market intervention induced by exchange rate "pressures" stemming from an interest-induced private capital inflow of I dollars. At one extreme, foreign central banks might simply stay on the sidelines and let the rates for their currencies depreciate (assuming these rates remain above the relevant mandatory intervention points under the EMA or IMF agreements); in this case, foreign central-bank reserve losses are zero and (k + g) is also zero. At the other extreme, foreign central banks might keep their exchange rates rigidly pegged against the dollar, so that private capital inflows to the United States would be exactly matched by foreign official dollar sales to the exchange market; in this case, foreign central banks must liquidate I dollars of interest-earning assets or of gold (again abstracting from changes in their dollar demand deposits which we assume are always kept at minimal working-balance levels).

Observation of the actual market behavior of foreign central banks suggests that they would choose a middle course, letting the exchange rate absorb part of the pressure and letting their reserves absorb another part. In recent years, central banks in foreign financial centers have tended to intervene rather actively in "smoothing out" exchange-rate pressures; it seems reasonable to assume, therefore, that (k + g) will generally lie between 0.5 and 1.0.[12] On the basis of this as-

[9] For an able exposition of this way of looking at the U.S. payments position, see Walter Gardner: "An Exchange Market Analysis of the U.S. Balance of Payments," International Monetary Fund, *Staff Papers*, May 1961, p. 196. Gardner's approach is criticized by Walther Lederer in *The Balance of Foreign Transactions: Problems of Definition and Measurement*, Princeton University, 1963, pp. 61-65, but Lederer's criticisms do not seem convincing to the present writer.

[10] Alternatively, policy-makers may be most concerned with changes in the U.S. gold supply. In this case, they would want to estimate the external cost of using monetary policy to achieve an inflow of short-term funds which would alter U.S. gold holdings by a given amount through its impact on foreign official reserves. Letting G stand for the resulting change in the U.S. gold stock, the relevant equation would be:

$$\frac{C}{G} = \frac{gIr + Fd}{gI}$$

[11] There will, of course, be important secondary effects. Higher short-term interest rates will tend to constrain domestic costs and prices, and domestic demand for imports, thereby strengthening the current account. But, compared with the impact on short-term capital flows, this effect will probably be weak and slow acting.

[12] It is important to realize that an interest-

sumption, and of Gray's earlier assumptions about the value of I, r, F and d, we can let k and g take varying values and generate the following values for C/R, the marginal cost of reducing foreign reserve accruals:

k + g = 0.5			k + g = 0.8		
k	g	C/R	k	g	C/R
0.1	0.4	16.0%	0.1	0.7	11.3%
0.2	0.3	15.3%	0.3	0.5	10.4%
0.3	0.2	14.6%	0.5	0.3	9.6%
0.4	0.1	13.9%	0.7	0.1	8.7%

k + g = 1.0		
k	g	C/R
0.1	0.9	9.8%
0.3	0.7	9.1%
0.5	0.5	8.4%
0.7	0.3	7.7%
0.9	0.1	7.0%

IV. *Influence of the Forward Exchange Rate*

Gray fails to mention that most international transfers of private short-term funds between investment media denominated in different currencies are made on a covered basis, and involve opposite transactions in spot and forward exchange markets. Being risk-averters, arbitragers generally seek to guard the value of their foreign-currency placements against an adverse movement in the exchange rate. If they switch out of domestic money-market assets and into foreign money-market assets, they will usually make a forward contract fixing the price at which they can convert their invested principal and interest back into their domestic currency. The placement of arbitrage funds thus depends on three variables: the relevant interest rate on domestic-currency, money-market assets; the relevant rate on foreign-currency, money-market assets; and the spread between spot and forward exchange rates expressed in percent per annum terms.

With a given level of interest rates abroad and a given set of exchange rates, a sufficient increase in domestic interest rates will induce an inflow of covered funds. But this inflow is bound to affect all three of the variables in the arbitrager's equation. As a first approximation, it is probably safe to ignore the effects of a covered arbitrage inflow on domestic and foreign interest rates (effects which can usually be offset by open market operations). *But one can hardly ignore the impact of a covered inflow on the spread between spot and forward exchange rates.* If short-term interest rates in New York rise relative to rates in London, there will be an initial incentive for an inflow of covered funds to New York. This inflow will generate an increased demand for spot dollars by arbitragers selling spot sterling, and an increased demand for forward sterling by arbitragers selling forward dollars. Other things being equal, the discount on forward sterling will fall; or, if forward sterling were at a premium against the dollar, this premium would increase. As a result, the initial covered incentive opened up by the establishment of higher short-term rates in the United States would tend to shrink and perhaps be erased altogether.

For policy makers, the key question is the amount of money likely to move before the initial incentive created by the rise in U.S. interest rates is erased by changes in the discount or premium on forward sterling. In fact, little if any money is likely to move. Foreign exchange dealers have quick minds and

induced capital inflow of I dollars to the United States might not suffice to cause an absolute reduction in foreign official reserve holdings. Weakness in other components of the U.S. balance of payments might still cause the dollar to be under net downward pressure in the exchange market. But, this does not affect our conclusions. The inflow of I dollars would still reduce the extent of the dollar's weakness in the exchange market, and, *ceteris paribus*, the amount of foreign official reserve accruals.

sharp pencils. They are quite aware that changes in interest-rate differentials will generate covered movements of short-term funds *if* spot and forward exchange rates are unchanged. They are also aware of just how these covered movements will alter the pattern of exchange rates. Accordingly, when interest-rate differentials change, dealers anticipate where spot and forward exchange rates will be pushed by arbitrage flows, and almost immediately change their rate quotations to these levels. In the absence of significant pressures, changes in forward exchange rates thus tend to erase, almost instantly, any covered interest advantage opened up by changes in international interest-rate differentials.[13]

[13] Developments following the next-to-last increase in the British bank rate (as of this writing) are a case in point. On February 27, 1964, the Bank of England increased its bank rate from 4 to 5 percent. As a result, the 3-month British bill rate rose from 3.64 percent on February 26 to 4.32 percent on February 27 (quotations at 11:00 a.m. New York time). With the 3-month U.S. bill rate yielding 3.52 and 3.55 percent, respectively, on each of these two days, the result was an increase in the *un*covered yield advantage of British over U.S. bills of 65 basis points. In these same 24 hours, however, the discount on forward sterling widened from 40 to 81 basis points in terms of percent per annum yield-equivalents. Consequently, although it was reduced from 28 to 5 basis points, the covered arbitrage advantage remained in favor of New York. Exchange market reports suggest that few if any arbitrage funds moved on either of these days between New York and London, so that the "neutralizing movement" in the forward rate clearly represented a reflex action by exchange dealers to the change in relative yields in London and New York. Moreover, one can argue that the neutralizing movement in the forward rate after the bank rate increase would have been even larger had the discount on forward sterling before the bank rate increase not reflected, in part, speculative positioning against sterling. (Exchange market reports suggest that the Bank of England was probably a heavy seller of dollars to the market during the weeks immediately preceding the bank rate increase; see, e.g., the article, "A Strategy for Sterling," in *The Economist* of February 29, 1964, p. 813.)

These considerations suggest that the inflow of interest-sensitive funds stemming from a tighter U.S. monetary policy are likely to be even more negligible than Gray has assumed. But, if the $1 billion estimate of "I" is overstated, probable values of C/I or C/R are likely to be considerably higher than 10 percent, even neglecting increases in interest rates in foreign centers.

V. *Flows of Funds into the Euro-dollar Market*

The argument just advanced would seem to suggest that a tighter U.S. monetary policy is an inept instrument for generating an inflow of short-term, interest-sensitive funds. Indeed, it seems to suggest that significant inflows and outflows of covered funds are unlikely to occur regardless of international interest-rate differentials! But this conclusion would not follow if a good part of the desired "inflow" represented a reduced outflow of U.S. funds into the Euro-dollar market.[14] Placements in this market do not expose U.S. investors to any exchange risk; accordingly, changes in forward-exchange premiums in response to changes in interest-rate differentials will not affect such placements.

There is good evidence for believing that in mid-1963 the U.S. monetary authorities were considerably more concerned about the outflow of funds into the Euro-dollar market than they were about U.S. investor purchases of money-market paper denominated in foreign currencies. Under Secretary Roosa stated before the Joint Economic Committee on July 9, 1963:

I did not have to look at any statistics at

[14] We use this term to denote the entire foreign market in U.S.-dollar time deposits; in particular, we define the Euro-dollar market to include the borrowing and lending of U.S.-dollar time deposits by Canadian banks.

all to know that from 1959 onward the development of the Euro-dollar market was pulling money by the billions into Europe, and it is and it has been.

There are no data on that market at all. Most of the funds flowing into that market are not even recorded as they leave the United States. We have not yet found ways of measuring, since so many of them are flows from U.S. corporations placed not just with the Canadian agency banks in New York which we can measure, but with a host of European banks and many of them even in unidentified accounts.[15]

This statement by Under Secretary Roosa raises a number of interesting questions:

(1) What is a reasonable range of guesses regarding the size of *gross* placements in the Euro-dollar market by U.S. residents from 1959 to mid-1963?

(2) Is it likely that these gross placements implied an equal build-up in the gold and dollar claims of foreign central banks, or is it likely that they resulted in an appreciably smaller increase in official foreign reserves?

(3) Now that some time has elapsed since the increase in U.S. bill rates in mid-1963 and, more significantly, since the rise in time-deposit rates at U.S. banks as a result of the modification of Regulation Q, what does the record show regarding *recorded* flows of U.S. resident funds to the Euro-dollar market? And, in this same recent period, how have "errors and omissions" behaved?

A. Gross Placements Abroad by U.S. Residents

Dollar deposits placed abroad by U.S. residents during a particular period show up in our balance-of-payments statistics as either reported short-term capital outflows or an increase in the debit figure (or decrease in the surplus figure) for "errors and omissions."[16] Information about short-term capital movements by U.S. residents is received by the U.S. Treasury on two different forms: end-of-month forms showing claims on foreigners by U.S. banks (the "B forms"); and end-of-quarter forms showing claims on foreigners by U.S. nonfinancial concerns (the "C forms"). The monthly reports of the commercial banks are believed to be quite accurate and relatively complete, but the quarterly nonbank reports have been subject to large and frequent revisions and are known to be incomplete.[17] U.S. banks do not place significant amounts of funds (whether their own or their clients') in dollar deposits abroad, so that most of the reported U.S. resident placements in the Euro-dollar market appear as changes in C-form totals under the caption "Short-Term Claims Payable in Dollars." After adjustment for variation in coverage, recent quarterly changes in such claims on

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[15] *Hearings before the Joint Economic Committee,* Congress of the United States, 88th Congress, First Session, July 8 and 9, 1963, Washington, D. C.: U.S. Government Printing Office, 1963, p. 106.

[16] When funds are placed abroad through foreign subsidiaries of U.S. corporations, our payments figures may show a greater "direct investment" outflow or a smaller figure for profit remittances.

[17] Under previous Treasury regulations, those required to report on C forms included "all exporters, importers, industrial and commercial concerns, and other nonbanking institutions located in the United States, whether sole proprietorships, partnerships, or corporations, including the agencies and affiliates in the United States of foreign concerns who have claims on 'foreigners'" averaging more than $100,000 for the previous two quarters. Wealthy individuals placing dollar deposits abroad are exempt from the reporting requirement. More importantly, many U.S. corporations with large short-term investments abroad appear to have been ignorant of the reporting requirement. Recently, the Treasury has made a series of extensive "reporting drives" bringing in many "new reporters" who should have been reporting all along.

Table

Increase in Dollar Claims by U.S. Nonfinancial Concerns on Major Financial Centers Abroad, 1960-1964 ($ million)

Period	Amount
1960—I	−20
II	54
III	54
IV	80
1961—I	78
II	221
III	55
IV	31
1962—I	111
II	11
III	62
IV	−81
1963—I	21
II	116
III	−34
IV	−185
1964—I	119
II	63
III	149

Source: Department of Commerce: *Survey of Current Business*, various issues.

"major financial centers abroad"[18] are shown in the table above. Cumulative quarterly changes in these reported holdings for the 3½ years prior to mid-1963 totalled $793 million. There is good reason to believe that nearly all of this reported rise in dollar claims by U.S. nonfinancial concerns represented placements of dollar deposits in Canada and in Europe, with the largest part representing placements in Canada.[19]

So much for the recorded figures. What can we hazard about the magnitude of unreported placements of dollar deposits abroad? In particular, is it likely that they have been of the magnitude which Mr. Roosa has suggested—i.e., "in the billions"?

[18] Canada, the U.K., the E.E.C. countries, and Switzerland.

[19] As of June 30, 1964, the total of reported C-form dollar claims on Canada was $806 million, as against a total of claims on the U.K. of $262 million, and a total on other European centers of $332 million. *Survey of Current Business*, September 1964, p. 16.

At first blush, examination of the annual figures for "errors and omissions" in our balance of payments figures would seem to support Mr. Roosa's thesis. Whereas "errors and omissions" averaged a plus $650 million a year in the four years 1956-1959, for the four years 1960-1963 they averaged a minus $800 million. This huge swing in the "balancing item" in our payments statistics coincided with large increases in the short-term dollar claims of foreigners reported on the C forms. In a pioneering test of this association,[20] Professor Philip Bell regressed "errors and omissions" against the combined dollar and non-dollar claims of U.S. nonfinancial concerns on Europe and Canada. Using annual data for the 10-year period 1952-1961, he obtained the following least-squares equation:[21]

$$Y' = 510 + 4.32X + 17.0t \qquad R^2 = 0.846$$
$$(.860) \quad (36.7)$$

where Y' = Errors and omissions

X = Changes in total short-term claims vis-a-vis Canada and Europe as reported by U.S. nonfinancial corporations with sign reversed so that an increase in claims is given with a minus sign to denote a capital outflow.

t = Trend.

Bell also regressed the "errors and omissions" item against the reported

[20] Philip W. Bell, "Private Capital Movements and the U.S. Balance-of-Payments Position", in *Factors Affecting the United States Balance of Payments*, a compilation of studies of the Joint Economic Committee, Washington, D. C.: U.S. Government Printing Office, 1962, pp. 447-466.

[21] *Ibid.*, p. 455. Using the same data for recorded changes in dollar claims but an "older series" for "errors and omissions," Bell derived another least-squares equation:

$Y = 447 + 3.82\,X + 14.5\,t \qquad R^2 = 0.902$

My comments below on the meaningfulness of the equation in the text apply equally to this second, similar relationship.

figures for dollar claims only, with results that were statistically significant but less so than the results shown above. Nevertheless, he concluded that actual U.S. corporate outflows of short-term capital to Canada and Europe in 1960 and 1961 were "between three and four times" as large as reported outflows, and that most of these unreported outflows were in the form of dollar deposits abroad.[22]

Closer scrutiny of Bell's analysis, however, raises a number of questions regarding the actual amount of short-term outflows embedded in the recent negative U.S. "errors and omissions" figures. As Bell himself points out in a footnote,[23] "the statistical significance of our results is dependent upon the fact that there were very large movements in errors and omissions and recorded outflows by nonfinancial corporations in the same direction in these two years [1960 and 1961]." Indeed, when Bell computes[9] a regression equations for the period 1952-1959, his R^2 turns out to be only .258, and his estimated regression coefficient is smaller than twice its standard error—hence below the customary level of "statistical significance."[24]

These results are hardly surprising. U.S. corporations did not begin to place U.S. dollar deposits in Canada on a substantial scale until 1960. These placements appear to have been induced partly by interest-rate differentials and partly by tax considerations.[25] Since these factors (and perhaps other influences as well) failed to induce significant outflows of U.S. nonfinancial funds before 1960, there does not seem to be much sense in estimating a postulated linear relationship between reported outflows and "errors and omissions" for the ten-year period, 1952-1961, which is what Bell did. Given the peculiar scatter of points shown in Chart I—which is simply a plot of the data Bell used in his regression equation—the high R^2 that he obtained for 10 annual observations seems meaningless.

Using more recent quarterly data, the present writer has also searched for a statistical association between "errors and omissions" and changes in dollar claims on major financial centers abroad reported by U.S. nonfinancial concerns. This was done by plotting the two scatter diagrams shown in Charts 2 and 3. These show the joint values of the two variables for the 16 quarters from the beginning of 1960 to the end of 1963 (using revised data recently released by the Department of Commerce). In Chart 2, neither variable is adjusted for seasonal variation; in Chart 3, the values plotted for "errors and omissions" have been seasonally adjusted by the Department of Commerce.[26]

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[22] *Ibid.*, p. 457. Since reported outflows for these two years totalled $550 million, Bell's conclusion suggests that total *un*reported short-term capital outflows during these two years ranged between 1.5 and 2 billion dollars.

[23] *Ibid.*

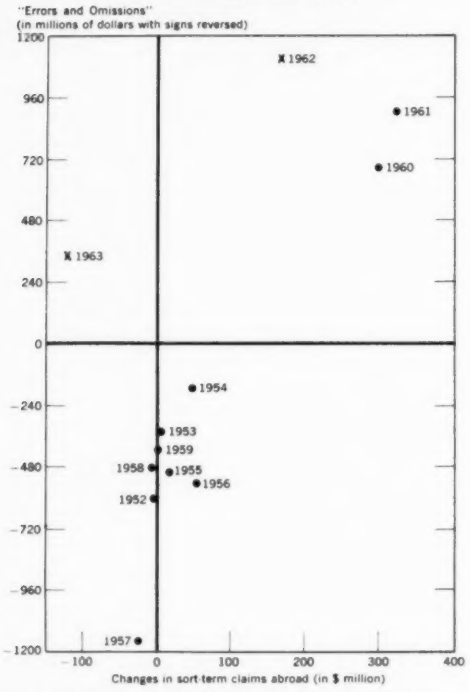
[24] *Ibid.* The coefficient of X is 4.46; the standand error is 3.86.

[25] The tax incentive existed for only two years, 1961 and 1962. It arose because of an increase in the Canadian withholding tax on dividends sent abroad by subsidiaries of non-Canadian corporations operating in Canada. This Canadian action, coupled with the then existing U.S. tax code, gave U.S. parent corporations "excess foreign tax credits", i.e., it meant that interest income on short-term investments abroad by U.S. parent corporations would be completely free of the U.S. corporate income tax. For many U.S. parent corporations, therefore, a 4 percent yield on a dollar deposit in Canada was the after-tax equivalent of an 8 percent yield on an investment in the United States. This powerful incentive was removed through special provisions of the U.S. Revenue Act of 1962. For details, see *Report of the Committee on Finance, United States Senate, to Accompany H.R. 10650*, 87th Congress, 2nd Session, Report No. 1881, August 16, 1962, pp. 72-74.

[26] Plotting a seasonally-adjusted variable against an unadjusted variable might seem absurd, but it can be defended on the grounds that there is no good basis for seasonally adjust-

Chart 1

Association between "Errors & Omissions" and annual changes in total short-term claims on Canada and Europe reported by U.S. nonfinancial concerns, 1952-61*

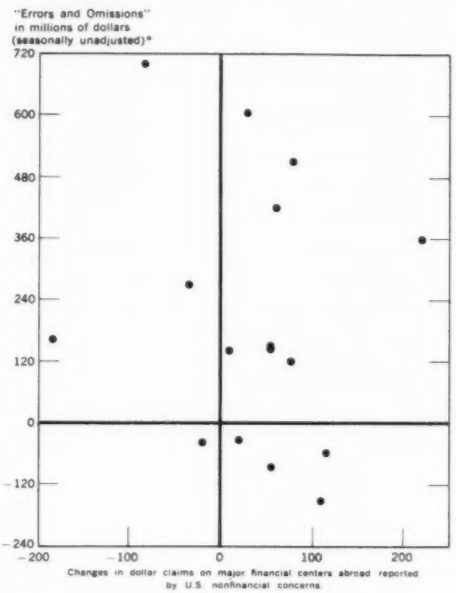


* Sign of errors and omissions is reversed so that points in the upper right hand corner suggest a coincidence of large reported, and large unreported, capital outflows.

Note: Data for 1962 and 1963, not available when Bell computed his regression equations, are plotted as crosses.

Chart 2

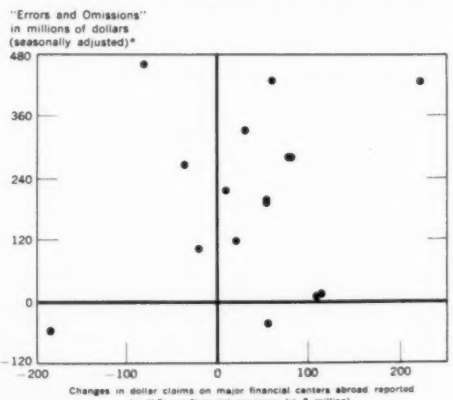
Association between seasonally adjusted "Errors & Omissions" and seasonally unadjusted changes in dollar claims on major financial cente abroad reported by U.S. nonfinancial concerns (quarterly data, 1960-6



* Sign of "errors and omissions" is reversed so that a positive figure corresponds to a capital outflow.

Chart 3

Association between seasonally adjusted "Errors & Omissions" and unadjusted changes in "dollar claims on major financial centers abroad" reported by U.S. nonfinancial concerns (Quarterly data, 1960-63)



* Sign of "errors and omissions" is reversed so that a positive figure corresponds to a capital outflow.

Neither chart shows any trace of a significant correlation.

This negative result, based on quarterly data, hardly demonstrates that there has *not* been a sizeable volume of unreported Euro-dollar placements by U.S. nonfinancial concerns in the past four years, when "errors and omissions" have had large negative values,[27] but it does—

ing recorded dollar outflows over this brief period, and no compelling *a priori* reason why these outflows should have a seasonal pattern. On this assumption, we are really comparing a seasonally-adjusted variable with a "seasonally-neutral" variable.

[27] Quarterly errors and omissions may be greatly affected by timing discrepancies between reported trade-and-services transactions and their counterpart in reported changes in claims on, and liabilities to, foreigners. These discrepancies may be large, and may vary from year-to-year.

at least—make this proposition less than self-evident. As Walther Lederer has pointed out,[28] there are many other factors that may explain the recent large negative values for annual "errors and omissions":

(1) Beginning in 1960, U.S. investors may have stepped up their purchases of European securities from foreign brokers, transactions not reported to our balance-of-payments compilers. This is a reasonable possibility in view of the strength of European currencies and the higher yields available on European securities;

(2) For much the same reasons, U.S. concerns may have stepped up the volume of their unreported direct investments in Europe;

(3) Unreported sales-promotion expenditures abroad by U.S. concerns selling in a more competitive market may have risen sharply;

(4) There may have been increased U.S. Government spending abroad in a form that escaped statistical recording.

Our conclusion, then, is that we can safely infer very little about the nature of the recent negative "errors and omissions" figures in our payments statistics. More than likely they have included substantial unreported dollar deposits placed in foreign banks by U.S. residents, but there are no grounds for believing that these unreported placements measured in "the billions", as Mr. Roosa suggested.[29] In particular, there is no statistical evidence showing a significant correlation between quarterly changes in reported dollar claims on foreign countries and the "errors and omissions" figures.[30]

B. Euro-Dollar Placements and Foreign Official Reserves

Even if placements in the Euro-dollar market by U.S. residents since 1959 have been several times as large as the recorded increase in U.S. dollar claims abroad, it is not at all clear that these gross outflows resulted in any significant rise in gold and dollar holdings of foreign central banks (which, we have argued,

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[28] *The Balance on Foreign Transactions: Problems of Definition and Measurement*, Princeton University, 1963, pp. 58-60.

[29] The Bank of England has recently stated that "U.K. banks" had dollar liabilities to U.S. residents totalling $319 million as of June 30, 1963 (nine days prior to Mr. Roosa's testimony quoted above). This sum would seem to be the outside total of cumulative U.S. corporate dollar placements in the London segment of the Euro-dollar market on that date. Since London is by far the leading center in the Euro-dollar market, it seems doubtful that cumulative direct U.S. dollar placements in European banks as of mid-1963 could have exceeded $500 million. (Admittedly, however, deposits of U.S. residents in Canadian banks may have been much larger than $500 million.)

The reader should note, as the Bank of England points out, that "'U.K. banks' refers to domestic [British] banks, accepting houses, and the London offices of British overseas banks and foreign banks." See the *Quarterly Bulletin* of the Bank of England, June 1964, pp. 100-101.

[30] The 1964 report of the Bank for International Settlements states that "*overseas affiliates* [my italics] of U.S. firms, partly in Europe but more especiallly in Latin America and the Middle East," have been large suppliers of funds to the Euro-dollar market in recent years. *Thirty-Fourth Annual Report*, Basle, 8th June 1964, p. 134.

If interest rates or other considerations had favored the investment of these funds in the U.S. money market, these affiliates might have made larger profit remittances to their U.S. head offices, thereby reducing the recorded U.S. payments deficit. Alternatively, they might have placed funds in the United States in their own name, in which case the U.S. payments deficit—as reckoned by the Department of Commerce—would have been unaffected. But, in either case, as the succeeding argument in the text suggests, foreign official reserves may have been unaffected by the "noncompetitiveness" of U.S. money-market rates prior to mid-1963.

ought to be the variable of crucial concern to U.S. policy-markers).

There are two reasons why the resulting increase in foreign official reserves may have been quite small. First, dollars placed in the Euro-dollar market by U.S. residents have, in many instances, returned almost immediately to the United States in the form of Euro-dollar borrowings by other U.S. residents. Thus, Canadian banks—whose acceptances of U.S. dollar deposits by U.S. residents undoubtedly exceed those of banks in any other foreign country—are substantial investors in U.S. government securities and in "street loans" in New York.[31] Big New York banks absorb large amounts of funds from the Euro-dollar market through their London branches, which are frequently aggressive bidders for Euro-dollar deposits. Finally, U.S. exporters of cotton, wheat, and other commodities often borrow heavily in the Euro-dollar market.[32] It might be argued, of course, that there is no necessary link between the volume of Euro-dollar placements by U.S. residents and the volume of Euro-dollar borrowings by U.S. residents. This view, however, seems untenable. Other things being equal, increased U.S. resident placements stimulate banks in the market to reduce their lending rates and to ease their credit-rationing standards. If U.S. borrowers are among those bidding for funds, they will receive their share of the larger volume of Euro-dollar loans made to all "final borrowers." Indeed, their "marginal share" may be higher than their "average share", since banks acting as intermediaries in the market may have an increasing reluctance to expand the absolute volume of their dollar loans to "urgent borrowers" outside the United States.

Second, many foreign importers and exporters have substituted Euro-dollar borrowings for loans from U.S. banks.[33] Increased placements in the Euro-dollar market by U.S. residents have undoubtedly furthered this substitution. As a result, one type of short-term capital outflow by U.S. residents (Euro-dollar placements) has simply replaced another type (U.S. bank loans to foreign borrowers) with only a negligible, or nonexistent, impact on foreign official reserves.[34]

C. Reversal of Gross Outflows to the Euro-Dollar Market Since Mid-1963.

As Chart 4 demonstrates, the relaxation in Regulation Q has been followed by a sharp narrowing of the yield spread between 3-month Euro-dollar deposits and 3-month deposits at U.S. banks. (On the other hand, there has *not* been any reduction in the spread between the Euro-dollar rate and the yield on U.S. Treasury bills.) This narrowing of the yield spread between these competitive rates in the second half of 1963 was accompanied by a reduction in recorded U.S. nonfinancial dollar claims on financial centers abroad of some $220 million.

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[31] See Oscar L. Altman, "Canadian Markets for U.S. Dollars," International Monetary Fund, *Staff Papers*, November 1962, pp. 305-308.

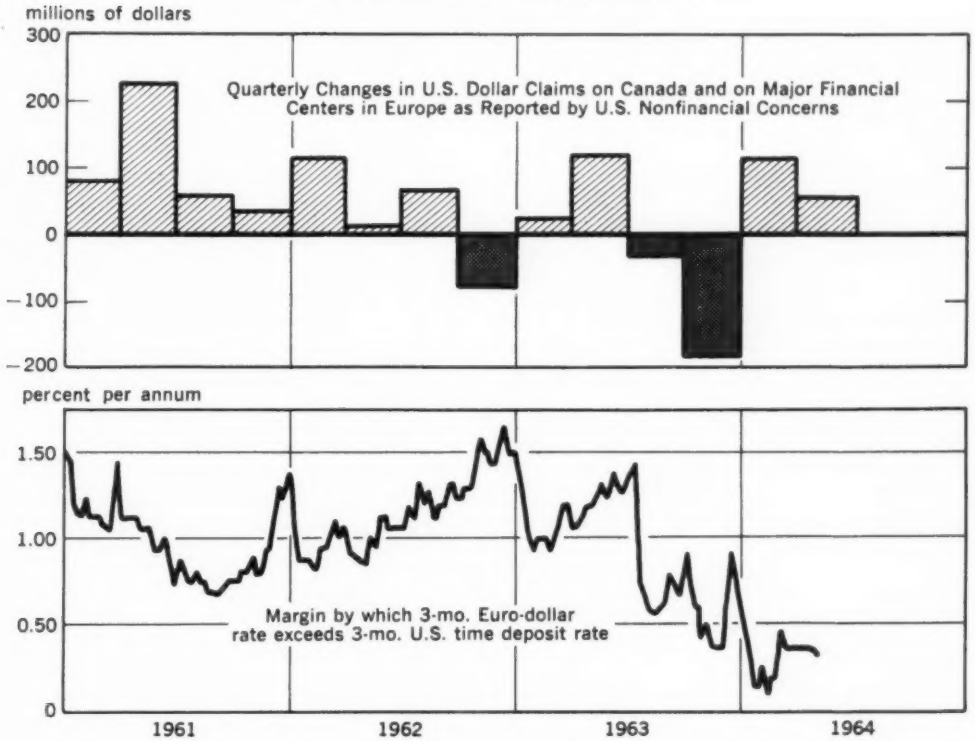
[32] See Bank for International Settlements, *Thirty-Fourth Annual Report*, Basle, p. 134.

[33] *Ibid.*

[34] Still a third type of "offset" has been suggested by Philip Bell. He argues (*op. cit.*, p. 466) that U.S. exports would have been significantly smaller in the absence of U.S. resident placements of dollar deposits abroad; for, in the absence of such placements, foreign purchasers of U.S. goods would have been unable to obtain Euro-dollar financing, and would also have been unable to obtain financing elsewhere on reasonable terms; thus, they would have cancelled their import orders. This argument seems farfetched to the present writer. In most cases, one would expect that alternative financing would have been available at less than prohibitive interest rates in the importer's country, or from the U.S. exporter's bank.

Chart 4

Quarterly changes in US Dollar Claims on Major Financial Centers Abroad and the Interest Rate Spread between the 3-month Euro-dollar Rate and the 3-month U.S. Time Deposite Rate



Figures for the first three quarters of 1964, however, show a renewed increase in dollar claims abroad of $331 million. (See the table on p. 000.) Accordingly, it seems premature to conclude that higher time-deposit rates in the United States have successfully reversed, or even checked, the outflow of U.S. funds to the Euro-dollar market.[35]

[35] And, of course, the decline in U.S. dollar claims abroad in the second half of 1963 may have been partly induced by other factors. For one thing, U.S. corporate treasurers no longer had the same tax incentive to earn interest abroad as they had in 1961 and 1962; their withdrawal of funds in the second half of 1963 *may* have been a delayed reaction to the change in the U.S. tax code (see footnote 25). Another possibility is that U.S. resident placements in the market were affected by the publicity given to the losses incurred by several "final lenders" in the market, as the result of defaults by U.S. borrowers in the fourth quarter of 1963. According to the authoritative report of the BIS cited above, the Euro-dollar market showed little if any overall growth from September 1963 to mid-1964.

During the second half of 1963, the figures for recorded short-term capital movements suggest that U.S. residents were withdrawing earlier placements from the Euro-dollar market, (Recorded C form claims on major financial centers abroad, payable in dollars, declined by $219 million). At the same time, however, "errors and omissions" were large and negative (−$430 million unadjusted, and −$210 million after seasonal adjustment). If one subscribes to the hypothesis that unreported capital transfers to and from the Euro-dollar market dominate the behavior of the "errors and omissions" item in the U.S. payments figures, one is forced to infer that *large reported net inflows* from the market were occurring at the same time as *large unreported net outflows*—a strange phenomenon.

VI. *Conclusions*

Certain general conclusions may be hazarded:

(1) In measuring the "marginal cost of hot money," Professor Gray has overlooked certain "feedback considerations," thereby biasing upward his estimate of C/I, the external cost to the U.S. of an interest-induced capital inflow.

(2) This point aside, C/I seems a concept of much less relevance to policy makers than C/R—the marginal cost of reducing foreign official reserves by a tighter money policy which operates mainly through its effect on private, interest-induced, capital flows.

(3) C/R is a difficult magnitude to estimate, but there are a number of reasons why it is likely to be quite high, probably well above the 10 percent per annum figure which, on the basis of quite conservative assumptions, Gray estimated for C/I:

(a) Higher interest rates in the United States are unlikely to induce any significant flow of covered-arbitrage funds out of investment in other currencies; this follows from the fact that forward exchange rates tend to adjust, almost automatically, to changes in yield differentials.

(b) Higher short-term interest rates in the United States may have been the crucial factor reversing the *gross* outflows of U.S. resident funds to the Euro-dollar market in mid-1963. But it is doubtful whether this reversal in gross outflows has had anything like a commensurate effect on reserve accretions by foreign central banks. Meanwhile, as Gray has pointed out, the United States has had to pay higher rates of interest on some $15 billion of interest-earning, foreign-owned, short-term dollar assets.

(4) Parenthetically, we would argue that the magnitude of gross outflows to the Euro-dollar market by U.S. residents, in the period from 1960 to mid-1963, was probably overestimated by U.S. monetary officials. In any event, one can question whether these gross outflows actually weakened the U.S. reserve position vis-a-vis foreign central banks.

(5) Our analysis supports Gray in casting doubt on the wisdom of recent U.S. efforts to maintain higher short-term interest rates. This policy has certainly hurt our current account by increasing the interest payments that we have had to make to foreigners;[36] its efficacy in inducing a significant reduction in foreign official reserve holdings seems questionable.

(6) Finally, it should be emphasized that we have assessed the cost of a tighter U.S. monetary policy only in terms of its net effect on a single balance-of-payments entry, "net income on investments." Other costs—more widely discussed and recognized—are undoubtedly of even greater importance in judging the appropriateness of an externally-oriented U.S. monetary policy.[37]

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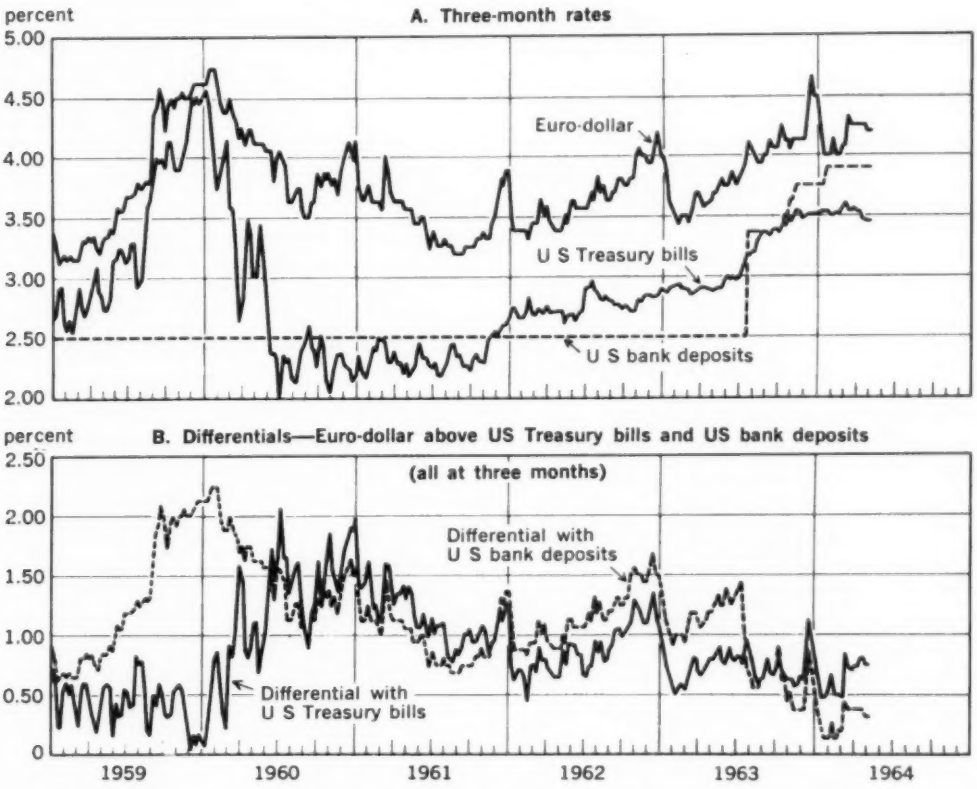
[36] The rise in interest payments to foreigners in the fourth quarter of 1963 was noted by Walther Lederer in his article, "The Balance of Payments in 1963," *Survey of Current Business*, March 1964, p. 19.

[37] The most important of these costs, of course, is the loss of real income, and the increased level of unemployment, that have stemmed from a "tighter-than-otherwise" monetary policy. The official contention that U.S. monetary policy has been "relatively easy" over the past several years (as shown by the substantial increase in the money supply) seems beside the point; the relevant comparison is with the "degree of monetary ease" that would have been desirable in the light of the continuing high level of unemployed resources.

Another hard-to-quantify cost of the more restrictive monetary policy that has been followed has been the higher cost of debt service to the Federal Government. Because a balanced budget (or a minimally unbalanced budget) has

Chart 5

US Treasury bills and US bank deposits (three-months) compared with Euro-dollar deposits in London (three-months) —yields, weekly, January 1959 onwards



N.B. The US Treasury bill rate has been considered the "plancher" or floor below which the Euro-dollar rate could not fall; it actually pushed up the Euro-dollar in 1959 (when the rediscount rate was raised). Since the increase of the rediscount rate to 3½ per cent on 17th July 1963 and the change in Regulation Q on the next day (when the maximum rate for three-month bank deposits was raised from 2½ to 4 per cent) the actual rate paid on bank deposits has risen sharply and from October 1963 has been above the US Treasury bill rate. In January 1964, the Euro-dollar rate had fallen to 4 per cent and the US bank deposit rate had risen to 3⅞ per cent.

such strong political appeal in this country, higher debt-management costs tend to limit Federal spending on projects and programs which—on a more rational calculus—might well be in the social interest. James Tobin has stressed this consideration as a reason for trying to keep U.S. interest rates low. See his monograph for the Commission on Money and Credit, "An Essay on Principles of Debt Management," in *Fiscal and Debt Management Policies*, by William Fellner and others, Englewood Cliffs, N.J.: Prentice-Hall, 1963, pp. 143-218.

Despite these considerations, U.S. monetary officials might still argue that they simply had to raise short-term interest rates in the United States in mid-1963, in order to persuade foreign central banks that we "meant business" in our program to defend the par value of the U.S. dollar. In the absence of an increase in our discount rate, they might argue, foreign central banks would have stepped up their demands for gold, endangering the whole delicate balance of "international financial cooperation." In any event, a corresponding defense of the latest discount rate increase (to 4.0 percent), in reaction to the rise in British Bank rate, would seem difficult to construct.

Debt Servicing In Sanction-Free Situations: A Comment

►BARBARA R. BERMAN

Professor Wilson Schmidt's analysis of the problem of debt service in an international context[1] is marred by a failure to follow his own assumptions to their logical conclusions. When this is done, the results look rather different.

Professor Schmidt asks the extremely interesting question of what we can deduce if we make the assumption that morality and prestige play no part in debtor countries' decisions on whether or not to live up to their debt-service obligations. The only thing that can keep them paying, by his assumption, is the hope of future or present benefit contingent on keeping up debt service. He then attempts to establish the minimum level of these benefits which will keep the debtor countries servicing their debts.

My quarrel with Professor Schmidt concerns the measurement of the benefits. To quote a key part of his argument:

> A rational debtor will not default if the present value of the future aid it will lose in the event of default exceeds the present value of the future service payments it must make on existing debts. The present value of a grant when it is made is, of course, equal to the grant itself. The present value of a loan to the debtor at the time it is made is equal to the face value of the loan *less the present value of the future interest and amortization payments discounted at the yield on capital in the debtor country*[2] [emphasis added].

From the point of view of inducing servicing on past debts, there is no necessity of subtracting from the value of the "bribe-loan" to the debtor the future service on this new loan. After all, if benefits are now necessary to induce the debtor to make service payments on past loans, why shouldn't it be assumed that he will not plan to make service payments on future loans without some additional incentive? Thus, the service payments on the new bribe-loan need not, from the morality-free debtor's point of view, be any cost at all.

To make the position clear, consider the case of a morality-free debtor country with a 10 percent rate of return on capital, which is scheduled to make debt service payments of $100 this year and for 10 succeeding years. Its only prospect of "aid" is a loan of $101 this year at 15 percent. This is clearly a losing proposition *if the debtor is planning to pay the service on the new loan.* However, under the assumption of rationality in a sanction-free situation, the debtor country should not default this year. It should take the new loan this year, and default on both it and the old loan next year.

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[1] Wilson E. Schmidt, "Default of International Public Debt," *The National Banking Review*, 2, March 1965, pp. 403-410.

[2] *Ibid.*, p. 404.

In one of Schmidt's examples, a creditor is said to find it worthwhile to give the debtor country a lump sum grant of $6.72 in order to keep it paying $1 a year for the next ten years, a stream whose discounted present value to the debtor is $6.71. I would agree that the grant will amply insure payment of this year's $1 debt service. But next year the same situation will arise again, and Schmidt's formula would have the creditor get himself hooked for an additional $6.24, which is the discounted value to the debtor of $1 debt service for nine years. And so on.

The correct rule is as follows: Morality-free, sanction-free debtors will not default so long as the present value of expected *net* capital inflow is greater than zero. It is always in their power to default, which will make the net capital inflow no worse than zero.

One curious fact that emerges from this analysis is that the form of the capital inflow (grants, soft loans, hard loans) which will prevent default is irrelevant. We had better face up to the fact that in a truly sanction-free bilateral situation, loans *are* grants if a candid creditor lets the expected net capital flow get below zero. The creditor country can perhaps redress the balance only by dropping some of its candor and holding out rosy hopes of distant but large future aid. Thus, it may have a chance to get repaid, at which time it can rethink its promise.

Rejoinder: Default on Debt Service

►WILSON E. SCHMIDT

There is no quarrel between us. (1) Dr. Berman's rule for the condition under which debtors will not default is the same as mine, as the reader may verify. (2) Subject to a qualification set forth below, I agree with her that "in a truly sanction-free bilateral situation, loans *are* grants if a candid creditor lets the expected net capital flow get below zero." This is why I put the emphasis on the present value of future aid. And this is why, when I turned to the question of new aid in the face of threats of default, I explicitly assumed some "*confidence* on the part of the creditor in the renewed pledge of the debtor to pay" [italics added]. There is no point in discussing new aid unless such an assumption is made, as Dr. Berman affirms. Hence, contrary to her assertion, I would not "have the creditor get himself hooked for an additional $6.24."

Confidence in the renewed pledge of the debtor may imply some morality on the part of the debtor. But it need not. It may only imply that the creditor is confident that it will be in its political interest and economic capacity to provide aid in the future in volumes sufficient to prevent default, a prospect which the debtor, who mistakenly threatens default, becomes aware of only when the creditor offers new aid in response to the threat. Or, confidence may imply the prospect of future private foreign investment which would not be forthcoming in the event of default. I argued that the "bribe-loan" was useful only when the yield on capital was higher in the debtor nation than in the creditor nation. It is precisely in this situation that one expects private capital flows, sooner or later. There is the notion that the rich countries ought to provide aid until the poor countries reach self-sustaining growth, i.e., are able to finance themselves out of their own resources plus external funds obtained on conventional terms. If this strategy were followed, confidence would be justified.

If creditor governments do not provide aid continuously, and want the debtors to repay their debts, the debtors would have to become net capital exporters. If so, default seems inevitable, barring some degree of morality. However, if private capital responds to yield differentials, the debtor becomes a net capital exporter only when the yield on capital in the debtor nation falls below that of other countries. With the prospect of becoming an international creditor, the debtor government would not wish to set a bad example for its future debtors. The same analysis applies if governments provide funds on hard terms, as I suggested, and behave in a maximizing fashion. Hence, under certain circumstances, loans need not become grants.

The paradox is that the threat to default is a good thing for the world as a whole. According to my argument, creditors, if they are rational, will not provide more aid unless the yield on capital is higher than at home, in which case more aid raises world output. If the yield constellation is reversed, a threat to default lies unchallenged by the creditor, bringing an end to an uneconomic transfer of resources.

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Current Legal and Regulatory Developments

I. *Lending Limit*

As a general rule, national banks may not lend more than 10 percent of their capital and surplus to any one borrower.[1] One of the exceptions to this rule, exception 10 to 12 U.S.C. 84, relates to obligations secured or covered by guaranties or by commitments or agreements to take over or to purchase made by the United States or any department or agency thereof. However, such guaranties, agreements, or commitments must be unconditional,[2] and must be performed by payment of cash or its equivalent within sixty days after demand by the bank. The Comptroller has held that a national bank may, pursuant to exception 10, make loans in excess of the bank's legal lending limit where the loan is insured by the Farmers Home Administration. This ruling was based on the fact that an agency of the Federal Government unconditionally agreed to pay cash for the note within thirty days after the bank demands payment. It was further held that the agreement constituted an unconditional guaranty on the part of the Farmers Home

[1] The 10 percent limitation of 12 U.S.C. 84 is subject to thirteen statutory exceptions.

[2] "Unconditional" is defined by the Comptroller in his Regulation 3 (12 C.F.R. 3), issued pursuant to 12 U.S.C. 84 (10). Regulation 3 states that the requirement of exception 10 that a guaranty, or commitment, or agreement to take over or to purchase must be "unconditional" means that the protection afforded to the bank thereby against loss resulting from factors beyond the bank's control must not be substantially diminished or impaired.

Administration within the meaning and requirements of exception 10, irrespective of the fact that demand by the bank for payment could not be made for a specified period of time.

In two other rulings, both involving loan programs of the Small Business Administration, the Comptroller has also held that exception 10 to the 10 percent lending limit is applicable. Under the first program, the Small Business Administration was to sell, with recourse, to private financial institutions, loans originally made by it to small business investment companies. These loans in the SBA's portfolio were seasoned, and it was contemplated that the remaining term at the time of their sale would average approximately two years. Under the second program, the SBA would guarantee loans having a maximum maturity of 15 years, made in the first instance by private financial institutions to small business investment companies. Under both programs, the SBA was to guarantee payment of principal and interest within 30 days after receipt of demand by the purchasing or lending financial institution. The right to make such demand upon the SBA would arise following a default for 90 days by the obligor SBIC.

The Comptroller held that the guaranties in both programs satisfied the unconditional requirements of both the regulation relating to loans secured or covered by guaranties of the Federal government,[3] and the statute pursuant to which the regulation was issued.[4] He ruled that, because exception 10 is applicable,[5] a loan purchased or made which has a guaranty of the SBA need not be considered in determining a national bank's lending limit[6] to the obligor of the loan.

In yet another ruling, the Comptroller held that, although contracts with the Federal government or an agency thereof may be assigned as security by the borrower to the lending bank, the loan in such cases is subject to the ordinary 10 percent limit in spite of the fact that the bank may protect itself without litigation in the event of default by the borrower. It was concluded that, in such circumstances, the loan is not within exception 10, because the governmental agency has not promised to pay in cash or its equivalent within sixty days after demand. However, the ruling noted that in some circumstances the bank may find it practicable to make an outright purchase of such government contracts rather than take assignments of them as security for loans. The Comptroller ruled that the lending limitations of 12 U.S.C. 84 were not intended to apply to the United States and that, therefore, such claims against the Federal government may be acquired by a national bank without any statutory limitations upon the amount.

Exception 13 to the 10 percent lending limit,[7] which relates to two-name installment consumer paper, provides that the obligations of the maker shall be the sole applicable loan limitation where an officer of the bank has certified that the maker's responsibility has been evaluated and that the bank is relying primarily on the maker for payment. The Comptroller recently ruled that exception 13 may be applicable where a builder takes out a home mortgage scheduled to liquidate in regular monthly installments over a 20-year period, where the house is thereafter sold to a buyer who assumes the mortgage by signing either an assumption agreement or the mortgage note, and where the builder is not released from

[3] 12 C.F.R. 3.

[4] 12 U.S.C. 84(10).

[5] See *The National Banking Review*, 2, December 1964, pp. 263-264, for a discussion of the most recent amendment to Regulation 3(12 C.F.R. 3) and the unconditional character of the guaranty of the government agency.

[6] Under 12 U.S.C. 84.

[7] 12 U.S.C. 84(13).

liability on the original loan. The Comptroller held that the original mortgage note becomes two-party installment consumer paper when the obligation to pay is assumed by the ultimate consumer, the homeowner, that the note thus falls within exception 13, and that the bank's lending limitation to the builder would therefore be equal to 25 percent of the bank's capital and surplus. The Comptroller further held that if, in addition, the bank places primary reliance upon the homeowner for payment of the mortgage note, and if it makes the appropriate certification with respect to such primary reliance as required by exception 13,[8] the obligation of the homeowner is the only obligation which must be considered in applying the limitations of the lending limit statute.[9]

II. *Real Estate Loans*

The Comptroller has issued a ruling that a national bank may make a loan secured by what, in effect, may afford the protection of only a second lien on real estate. The particular loan, which was not a real estate loan subject to any restrictions or limitations of the real estate lending statute, was made in participation with an insurance company which was not permitted to make mortgage loans in excess of 75 percent of the appraised value of the real estate. The national bank was to participate in the mortgage loan over 75 percent, but not in excess of 80 percent, of the appraised value. Although the bank's participation was to be fully paid within three years, the distribution of foreclosure proceeds would not be on a pro-rata basis, inasmuch as the proposed participation agreement provided that the proceeds of any foreclosure sale would first be applied to reduce the insurance company's participation and, after payment in full of such company's participation, any amount then remaining of the proceeds would be paid by the insurance company to the bank up to the amount of its participation.

The Comptroller stated that this arrangement by which the bank would recover its participation only after the insurance company recovered its full participation, raised a question as to whether the bank's loan would be secured by a second lien on real estate rather than by a first lien. However, the Comptroller held that where, as in this case, the insurance company made a mortgage loan, and the national bank was willing to make an unsecured loan to the homebuyer in the amount of its participation and take a separate unsecured note in connection therewith, and where the bank was willing to make the same extension of credit to the homebuyer through a participation and security arrangement involving only one note, the bank was, in fact, making a loan in substantial reliance on the creditworthiness of the borrower. The Comptroller ruled that, in such circumstances, a loan did not constitute a real estate loan within the meaning, or subject to the requirements, of 12 U.S.C. 371, although as a matter of prudent banking practice it was also secured or in some manner protected by either a first or junior lien on real estate.[10]

The Comptroller has ruled on the question of whether, in connection with the amortization provisions of the real estate lending statute applicable to national banks,[11] it is necessary that the amortization provisions be spelled out in the loan instrument, or whether an oral

[8] A discussion of this statutory requirement of appropriate certification with respect to primary reliance appeared in *The National Banking Review*, 1, September 1963, pp. 134-135.

[9] 12 U.S.C. 84.

[10] See *The National Banking Review*, 2, March 1965, p. 428 for a discussion of, and references to, similar rulings involving loans which were not real estate loans but which were secured by real estate in some form.

[11] 12 U.S.C. 371.

agreement to pay in adequate installments suffices. It was held that the amortization schedule in the case of a real estate loan should be in writing. In the absence of such a schedule in the mortgage note, the bank would encounter problems in a foreclosure based on the obligor's failure to meet the schedule of payments agreed to between the parties. The failure to include an amortization schedule would also reduce the bank's ability to sell the note in an effort to increase its liquidity. The ruling noted that many agreements specifically provide that the only terms and conditions binding upon the parties are those contained therein, and that the agreement may be modified only by written agreement. It was also noted that the statutory requirement of amortization, i.e. that there be a reduction of the principal of the debt during the life of the loan, ordinarily contemplates a regular schedule of payments. The Comptroller previously ruled that any deviation from a regular schedule of payments should be based on prudent banking judgment. The basis for such judgment should be amply disclosed to the examiner.[12]

III. *Real Estate Insurance*

The Comptroller has ruled that a national bank may lawfully purchase and use real estate mortgage errors-and-omissions insurance. The ruling noted that a bank may, through such insurance, protect itself against loss in connection with its mortgagee interest in real property, and provide for payment of damages incurred in any mortgagee, mortgage-fiduciary, or mortgage-servicing capacity by reason of failure to maintain insurance against the risks for which it customarily requires its mortgagors to provide insurance, by reason of error or omission of the mortgagor to procure and maintain such insurance, or by reason of the inadequacy of such insurance. Through the use of errors-and-omissions insurance, a national bank may thus transfer to its customers the responsibility for maintaining appropriate insurance designed to protect the respective interest of both mortgagor and mortgagee.

IV. *Ownership of Credit Bureau*

The Comptroller has held that it is permissible for a national bank directly, or indirectly through a subsidiary,[13] including a safe deposit company, to purchase control of and operate a credit bureau. He stated that, under paragraph Seventh of 12 U.S.C. 24, a national bank may exercise, through its board of directors and duly authorized officers, employees and agents, all such incidental powers as shall be necessary to carry on the business of banking, including the acquisition and operation of an existing credit bureau. He further stated that, although the primary purpose of the acquisition and operation of a credit bureau would be to provide better credit-analysis facilities for the bank, the bank may, in order to employ the facilities most profitably, offer them to others.

V. *Check Guaranty*

The Comptroller has given his approval to a national bank's proposed check cashing program. Under that program, pursuant to a contract with participating retail stores, the bank would agree to cash checks drawn upon it, not in excess of $50.00, where the checks were cashed by a participating store upon presentation by the bank's depositor of an appropriate

[12] For a discussion of instances in which deviations from a regular schedule of payments may be permitted, see *The National Banking Review*, 1, September 1963, p. 135.

[13] In this connection, see *The National Banking Review*, 2, March 1965, pp. 430-431 concerning ownership of a mortgage service corporation as a subsidiary.

identification card. It was noted in the ruling that a national bank, generally, may not lend its credit or become a guarantor on an obligation, or bind itself as surety to indemnify others in the event of loss, unless it has a substantial interest in the performance of the transaction involved, or has an earmarked deposit sufficient in amount to cover the bank's total liability as indemnitor.[14] However, the Comptroller concluded that a national bank has a sufficient interest in facilitating the cashing of checks by its depositors so that it may, under its corporate powers as enumerated in paragraph Seventh of 12 U.S.C. 24, guarantee checks drawn upon it and cashed by a merchant in accordance with established procedures.

VI. *Loans Secured by Coins*

The Comptroller has held that a loan secured by a coin collection is subject to the requirement that loans by a national bank secured by coins of the United States must be limited to 70 percent of the face value of the coins.[15] The Comptroller noted that the maintenance of adequate coin circulation is as important to sound banking and to the public interest as the making of good loans, and that when the scarcity of coins seriously affects the capacity of banks to meet their customer needs they have a public duty to refrain from making loans which will keep coins out of circulation. He further noted that it is not possible to distinguish coin scarcity caused by professional dealers and collectors from scarcity caused by speculators and hoarders.

[14] See *The National Banking Review*, 2, September 1964, p. 98.

[15] This requirement, which was set forth in a ruling effective on July 30, 1964, was discussed in *The National Banking Review*, 2, March 1965, p. 430.

VII. *Brokered Deposits*

In a directive to examining personnel, the Comptroller treated the use of money brokers as an unsafe and unsound means of acquiring deposits. National bank examiners were instructed to ascertain and report the following facts wherever brokered money is found: (1) the aggregate amount of brokered money deposited in the bank; (2) the aggregate amount of commissions paid by the bank to the broker; (3) the aggregate amount of commissions passed on by the broker to the depositor; (4) the identity and address of each broker; and (5) the aggregate amount of brokered deposits originating outside of the bank's normal trading area. Cases revealing substantial use of money brokers are to be separately and promptly reported to the Comptroller.

National bank examiners have also been instructed that special attention should be given to the following: (1) the acceptance through a broker or otherwise of a certificate of deposit disproportionate in amount to the bank's usual deposit size; (2) acceptance through a broker or otherwise of certificates of deposit from depositors located outside of the bank's normal trading area; and (3) issuance of certificates of deposit disproportionate to the normal ratio such obligations bear to the bank's total deposit liabilities. In addition, the examiners have been instructed that whether or not certificates of deposits have been obtained through "money brokers," if outstanding certificates exceed 10 percent of total deposits, the bank's liquidity position should be thoroughly analyzed. Wherever it appears that a liquidity problem may develop, or practices which may lead to illiquidity are being followed, a schedule of outstanding certificates of deposit are to be set forth in the bank's report of examination, including the following information: (1) amount of certificates of deposit; (2) name and address of depositor; (3) iden-

tity and address of broker, if any; and (4) maturity date.

In any case where the examiner, in his judgment, believes that a serious problem may exist, a separate report containing the foregoing information is to be sent promptly to the Comptroller. The examiner in such cases will also direct the bank management to institute immediate corrective measures which will be continuously surveyed by the Comptroller's Office.

It was noted in this directive, however, that in some communities the certificate of deposit is frequently used in lieu of, and is functionally similar to, a savings account. Deposits represented by such certificates of deposit are usually as stable as savings accounts.

The Comptroller noted that certain well-established and nationally-known firms, such as exist in the New York money market, customarily maintain a market in negotiable certificates-of-deposit of leading banks and in commercial paper. The directive specifically instructed the examiners not to criticize normal transactions of such firms in such markets.

VIII. *Voting Trusts*

It has been previously held that prior approval of the Comptroller is required in connection with the creation, modification, or extension of voting trusts of stock in national banks. This requirement is designed to insure that the operation of a voting trust will not adversely affect the welfare of the bank.[16] Recently, the Comptroller stated that he will not ordinarily approve a voting trust agreement unless it contains provisions which, in effect, provide that the Comptroller may terminate the agreement, in whole or in part, at any time he deems such termination to be in the best interest of the bank. The Comptroller must also be able to require the resignation as trustee of any person at any time he deems such resignation to be in the best interest of the bank, and each trustee must agree to resign forthwith if required to do so by the Comptroller. If the trust is to cover a number of shares sufficient to elect one or more directors of the bank, by cumulative voting or otherwise, the trustees must agree not to nominate or cast their votes for any person as a director whom the Comptroller has designated as unacceptable. Finally, the books and records of the trustees with respect to the voting trust must be available to the Comptroller for examination upon demand.

IX. *Community Development*

The Comptroller has held that national banks may invest in statewide development credit corporations located in the state in which the bank operates. It was noted that such a corporation, which would be allowed to operate at a profit, would have as its purpose the extension of nonbankable credit designed to retain and expand existing industries and attract new industries.[17] He noted, however, that such investment would probably not qualify as an "investment security" within the meaning and requirements of the Investment Securities Regulation,[18]

[16] In this connection, see *The National Banking Review*, 2, March 1964, p. 429.

[17] This ruling was a specific application of an earlier ruling which stated that national banks, as a necessary business expense, may make reasonable contributions to local community agencies and groups to further the physical, economic, and social development of their communities, and that such contributions may take the form of an investment in a corporation organized to carry on such activities. The aggregate investment in such corporations may not, however, exceed 2 percent of the bank's capital and surplus. See *The National Banking Review*, 2, September 1964, p. 96.

[18] 12 C.F.R. 1.3(b), 1.5 and 1.6.

and therefore should be charged off as a business expense and not be carried as part of the bank's assets.

X. *Inspection of Bank Examination Reports*

The Comptroller denied the request of a state bank to grant national banks the authority to furnish their correspondent banks with their reports of examination in connection with proposed loan participations. The request asserted that a state superintendent of banks had agreed to authorize the banks under his supervision to furnish reports to national banks in similar circumstances.

In his denial, the Comptroller stated that the disclosure of a report of examination as a condition to loan participation gives rise to anti-trust questions, and results in the dissemination of information concerning bank customers and their financial affairs which have traditionally been regarded as confidential by the courts, the bank regulatory agencies, and the banking community itself. He further stated that the bank's copy of an examination report is the property of the Comptroller, and is furnished to the bank solely for its confidential use.[19]

The Comptroller also denied a request of a state authority to inspect the reports of examination and other records of a national bank. The state authority was concerned with a loan by a national bank to a municipality, allegedly made without the prior approval of the appropriate state agency. In his denial, the Comptroller stated that the successful functioning of his Office depends in great measure upon its ability to obtain information about the affairs of the banks and their customers on a confidential basis, and that it is the long-established policy of the Office to disclose information only where the Congress has specifically prescribed such disclosure. For example, although a state department or bureau of labor may obtain a verification of a national bank's payroll records for unemployment compensation purposes, the state office must follow certain statutory procedures specifically prescribed and authorized by the Congress.[20]

XI. *Records Retention*

As was indicated in this column in the December 1964 issue of the *Review*,[21] there are no Federal statutes specifically relating to records retention by national banks. However, it should be noted that several regulations of the Comptroller are applicable to the retention of certain records. For example, a national bank acting as a general insurance agent, or as a broker or agent for loans on real estate,[22] must keep records available for inspection by bank examiners. These include authorization statements and certificates; copies of the agent-bank's reports; adequate records of insurance transactions and loans, with separate entries and accounts; and such records as may be required by insurance companies. These records must be retained permanently, except for copies of records made by the agent bank to each insurance company which it represents and records of loans negotiated by the bank acting as broker or agent in making or procuring loans on real estate, which must be kept for a

[19] In this connection, see *The National Banking Review*, 1, June 1964, pp. 603-604.

[20] As set forth in 26 U.S.C. 3305(c), and as discussed in *The National Banking Review*, 1, June 1964, pp. 603-604.

[21] See *The National Banking Review*, 2, December 1964, p. 266, where it was stated that national banks should be guided by existing state law in the retention of their records.

[22] Pursuant to 12 U.S.C. 92, which provides that national banks may, in places the population of which does not exceed five thousand people, act as general insurance agents and as brokers for loans on real estate.

period of five years.[23] Similarly, a national bank exercising trust powers[24] must keep a separate set of books and records showing in proper detail all permissible fiduciary transactions engaged in under the Comptroller's Trust Regulations and state and local law. Although there is no specified retention period for these records, such records should be kept for a reasonable length of time.[25] In addition, certificates executed by a national bank in connection with installment consumer loans[26] must be retained until repayment of the loan.

XII. *Messenger Service*

It has been held that a national bank which operates an armored-car messenger service for its customers, may extend this service so as to operate between any subscribing merchant's place of business and the bank of his choice.[27] The ruling also held that a national bank may service other customers with the excess capacity of the armored-car messenger service it provides primarily for its own customers. Although it was stated that a bank may conduct this service through its ownership and operation of an armored car, or through the organization of a subsidiary or other affiliate corporation, banks were cautioned that, irrespective of which means it uses, the service must be performed pursuant to an agreement which specifies that the servicing national bank is the agent of the subscriber and not the agent of the subscriber's bank. Banks were also cautioned that before extending armored-car service, they should explore, with bank counsel, the question of whether the armored car would be operating as a common or contract carrier. It is possible that Federal law and licensing requirements will apply, particularly where armored-car service constitutes interstate commerce; in such cases, it is also possible that the laws of several states will apply.

XIII. *Key Man Insurance*

In a recent ruling, a national bank was advised that a salary level of $8,000 per year does not alone warrant a conclusion that the employee's services are of such value to the bank that he may properly be regarded as a key man. The bank was informed that all insurance policies which do not protect the bank against the unexpected loss of employees who are in fact key personnel must be liquidated, and that all insurance policies purchased to indemnify the bank for any post-employment payments to the bank's employees must be liquidated wherever the bank is not obligated to make such payments.[28]

[23] 12 C.F.R. 2.2 and 2.4.

[24] Pursuant to 12 U.S.C. 92(a).

[25] 12 C.F.R. 9.8.

[26] Under exception 13 of 12 U.S.C. 84, fo a discussion of exception 13 in this issue of the *Review*, see p. 000.

[27] Previously, it was held that a national bank may provide messenger service by means of an armored car to meet the requirements of its customers. See *The National Banking Review*, 1, March 1964, p. 431.

[28] The Comptroller had ruled previously that a national bank may purchase insurance, for the benefit of the bank, on the life of an officer whose death would be of such consequence to the bank as to give it an insurable interest in his life, and that the board of directors of a national bank, pursuant to paragraph Fifth of 12 U.S.C. 24, may enter into employment contracts with its officers and employees upon reasonable terms and conditions. He had also previously ruled that such authority extends to employment contracts which provide for deferred compensation, and that the bank may protect itself against such contractual obligations by means of an insurance program. In the issuance of these rulings, the Comptroller held that the amount of the insurance coverage must bear a direct relation to the bank's risk of loss of key personnel and to its obligations under employment contracts; that, under no circumstances, may such an insurance policy represent a part of the investment program of the bank;

XIV. *Disclosure Regulations*

A number of amendments have been issued to the Comptroller's disclosure regulations.[29] These regulations implement legislation passed by the Eighty-Eighth Congress[30] under which certain provisions of the Securities Exchange Act of 1934[31] were made applicable to any national bank with a class of equity securities held by 750 or more persons.[32] The Comptroller's amendments provide specific further exemptions from sections 16(a),[33] 16(b),[34] and 16(c)[35] of the Securities Exchange Act of 1934, in respect to those banks and their affiliated personnel to which the Exchange Act applies.

Under the first amendment,[36] the short-swing transactions of an investment company registered under the Investment Company Act of 1940 have been exempted from the provisions of section 16(b) of the Exchange Act if an order of the Securities and Exchange Commission has been entered pursuant to section 17(b) of the Investment Company Act exempting the transaction from the provisions of section 17(a) of that Act.

The second amendment[37] provides that any transaction of purchase and sale, or sale and purchase, of an equity security of a bank that is effected in connection with the distribution of a substantial block of such securities, shall be exempt from the provisions of section 16(b) upon the following conditions:

(1) The person effecting the transaction is engaged in the business of distributing securities and is participating in good faith, in the ordinary course of business, in the distribution of the block of securities;

(2) The security involved is (i) a part of the block of securities, and is acquired by the person effecting the transaction with a view to its distribution, from the bank or other person on whose behalf such securities are being distributed or from a person who is participating in good faith in the distribution of the securities; or (ii) a security purchased in good faith by, or for the account of, the person effecting the transaction for the purpose of stabilizing the market price of securities of the class being distributed, or to cover an over-allotment or other short position created in connection with the distribution; and

(3) Other persons not within the purview of section 16(b) are participating in

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and that such an investment would be contrary to the provisions of paragraph Seventh of 12 U.S.C. 24. See *The National Banking Review*, 2, December 1964, p. 269; and 1, June 1964, p. 602.

[29] These amendments, which were effective immediately upon their publication in the Federal Register, appear as new sections 12.7 through 12.12 to Title 12 of the Code of Federal Regulations.

[30] P.L. 88-467.

[31] 15 U.S.C. 78.

[32] See *The National Banking Review*, 2, September 1964, pp. 98-99 for a discussion of these regulations.

[33] Section 16(a) of the Securities Exchange Act of 1934 requires the reporting by an insider of his initial holding, and substantial changes in holding, of equity securities of the national bank with which the insider is affiliated. Under the Comptroller's Regulation (12 C.F.R. 12.2) every principal stockholder, director, and principal officer of a national bank to which the Securities Exchange Act of 1934 is applicable, is required to file such ownership reports with the Comptroller of the Currency. This Regulation (12 C.F.R. 123) defines the terms "principal officer," "principal stockholder" and "substantial change."

[34] Section 16(b) of the Securities Exchange Act of 1934 imposes liability on the insiders referred to in footnote 33 for short-swing trading profits.

[35] Section 16(c) of the Securities Exchange Act of 1934 prohibits short sales and sales against the box by the insiders referred to in footnote 33.

[36] 12 C.F.R. 12.7.

[37] 12 C.F.R. 12.8.

the distribution of the securities on terms at least as favorable as those on which such person is participating, and to an extent at least equal to the aggregate participation of all persons exempted from the provisions of section 16(b) by the amendment. However, the performance of the functions of manager of a distributing group, and the receipt of a bona fide payment for performing such functions, shall not preclude an exemption that would otherwise be available under this paragraph. This amendment further provides that the exemption of participation in a transaction does not render the transaction exempt with respect to the participation of any other party unless the other party also meets the conditions of the amendment.

A third amendment[38] provides that any equity security of a bank shall be exempt from the operation of section 16(c) to the extent necessary to render lawful the execution by a broker of an order for an account in which he had no direct or indirect interest.

The fourth amendment[39] provides that any equity security of a bank shall be exempt from the operation of section 16(c) to the extent necessary to render lawful any sale made by or on behalf of a dealer in connection with a distribution of a substantial block of the bank's securities, upon the following conditions:

(1) The sale is made with respect to an over-allotment in which the dealer is participating as a member of an underwriting group, or the dealer or a person acting on his behalf, intends in good faith to offset such sale with a security to be acquired by or on behalf of the dealer as a participant in an underwriting, selling, or soliciting-dealer group of which the dealer is a member at the time of the sale, whether or not the security to be so acquired is subject to a prior offering to existing security holders or some other class of persons; and

(2) Other persons not within the purview of section 16(c) are participating in the distribution of such block of securities on terms at least as favorable as those on which such dealer is participating, and to an extent at least equal to the aggregate participation of all persons exempted from the provisions of section 16(c) by this amendment. The performance of the functions of manager of a distributing group, and the receipt of a bona fide payment for performing such functions, shall not, however, preclude an exemption that would otherwise be available under this amendment.

Under the fifth amendment,[40] whenever any person is entitled, as an incident to his ownership of an issued equity security of a bank, and without the payment of consideration, to receive another security of the bank "when issued" or, "when distributed," the security to be acquired shall be exempt from the operation of section 16(c) if the sale is made subject to the same conditions as those attached to the right of acquisition; such person exercises reasonable diligence to deliver such security to the purchaser promptly after his right of acquisition matures; and such person reports the sale on the appropriate form for reporting transactions by persons subject to section 16(a).[41] This amendment also provides that it shall not be construed to exempt transactions involving both a sale of a security "when issued" or "when distributed," and a sale of the security by virtue of which the seller expects to receive the "when issued" or "when distributed" security, if the two transactions combined result in a sale of more units than the aggregate of those owned by the seller plus those to be received by him pursuant to his right of acquisition.

[38] 12 C.F.R. 12.9.
[39] 12 C.F.R. 12.10.
[40] 12 C.F.R. 12.11.
[41] Form OR-2.

A final new amendment[42] provides that it shall be unlawful for any director or principal officer of a bank to effect any foreign or domestic arbitrage transaction in any equity security of the bank, unless he shall include the transaction in the statements required by section 16(a) of the Securities Exchange Act and the Comptroller's stock ownership report regulation, and shall account to the bank for the profits arising from the transaction, as provided in section 16(b). This amendment further provides that the provisions of section 16(c) shall not apply to such arbitrage transactions, and that the provisions of the ownership report regulation and of section 16 shall not apply to any bona fide foreign or domestic arbitrage transaction, insofar as it is effected by any person other than the director or principal officer of the bank issuing the security.

XV. *Proxy Solicitation*

An amendment has been adopted in connection with the regulation[43] relating to the solicitation of proxies from shareholders of national banks.[44] The amendment requires those persons who solicit proxies other than on behalf of the bank to notify the bank's management in writing at the time of the solicitation. The specific requirement is that, simultaneously with the filing of proxy solicitation material with the Comptroller's Office, one copy of all such material must be sent by first class, registered, or certified mail to the attention of the President or Senior Vice President of the bank at its main office.

XVI. *Change of Control Reports*

The Comptroller has published proposed amendments[45] to Regulation 12.[46] This regulation deals with changes in the ownership and control of national banks. The purpose of the amendments is to impose certain additional requirements as to publication and reporting in connection with transactions which result in a change in the control of a national bank. The amendments would require that a copy of the report of change of ownership, now required to be filed by the bank with the Comptroller, be published in a newspaper located in the town where the bank is located. This report indicates the identity of the purchasing group and other facts concerning the transaction. The purchasing group of shareholders would be required to record their purchases of stock on the books of the bank within two business days after the transaction. In addition to the report filed by the bank, the purchasing shareholders would be required to file a prompt report of the transaction with the Comptroller.

Within ten days following a transfer of control, the purchasing group would be required to file complete biographical and financial information with the Comptroller. Any person who becomes a chief executive officer or a director of a bank within twelve months following a change of control, would be required promptly to file complete biographical and financial information with the Comptroller. No member of the purchasing group or any new chief executive officer or director following the purchase would be permitted to participate in any manner in the conduct of the affairs of the bank until the required biographical and financial information had been filed and accepted by the Comptroller.

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[42] 12 C.F.R. 12.12.

[43] 12 C.F.R. 11.

[44] Discussed in *The National Banking Review*, 2, September 1964, pp. 98-99.

[45] *Federal Register*, March 23, 1965.

[46] 12 C.F.R. 12, originally promulgated in December 1962 and amended in August 1964. A discussion of Regulation 12 appears in *The National Banking Review*, 1, September 1963, p. 138, and 2, September 1964, pp. 98-99.

XVII. *Nomination of Bank Directors*

The Comptroller has published a proposed regulation[47] relating to the requirement that notice be given prior to the nomination of a national bank director. Under the proposed regulation, any national bank may provide in its articles of association or bylaws for a requirement that any shareholder who intends to nominate, or to cause to have nominated, any candidate for election to the board of directors, other than any candidate proposed by the bank's present management, shall notify the bank's chief executive officer and the Comptroller. The articles of association or bylaws could also provide that such notification must be sent by first class registered mail to each of these persons, at least 21 days before the scheduled meeting of shareholders at which directors will be elected, and that the notification must contain, to the extent known to the shareholder giving such notification, the names and addresses and the principal present occupations of all such nominees, the total number of shares that, to the knowledge of the nominating shareholders, may be voted for each of the proposed nominees, and the name and residence address of the nominating shareholder. Under the proposed regulation, if a national bank duly adopts these notice requirements, any nomination for directors not in accordance therewith may be disregarded by the chairman of the meeting and the votes cast for each nominee may be disregarded by the vote tellers. However, the regulation would further provide that, in the event a person is nominated by more than one shareholder, the nomination must be honored and all shares shall be counted if at least one nomination for that person complies with the regulation.

[47] *Federal Register*, April 29, 1965.

XVIII. *Trust Departments*

The Comptroller has suggested three alternatives as being acceptable in a case where a national bank and certain other banks located in the same area were too small to justify trust departments of their own. The banks had proposed an arrangement whereby they could refer the trust business of their customers to a state-chartered trust company. The first suggestion was for the national bank to apply for trust powers, qualify as fiduciary for its customers, and enter into an agency relationship with the trust company to provide for the administration of trust business. A second suggestion was for the national bank with trust powers to act as agent for the trust company, and to refer the trust business of its customers to the trust company. A third suggestion was for the national bank's directors, as trustees for the benefit of the national bank's shareholders, to acquire and hold the trust company's stock. The ruling noted that, whichever of these alternatives was adopted, an arrangement should be made to compensate the national bank for whatever services, such as record keeping, it performed.

XIX. *Collective Investment and Regulation 9*

A ruling has been issued concerning the applicability of the provisions of Regulation 9[48] pertaining to collective investments to the "Taft-Hartley" type of employee-benefit account established by union locals and employers of a particular trade. The subject trust was the result of bargaining between a union and an employer's group which resulted in a

[48] 12 C.F.R. 9 is the Comptroller's Regulation (issued under 12 U.S.C. 92a) which governs national banks in their exercise of fiduciary powers and their operation of collective investment funds.

single contractual relationship under which a trust was established to fund the pension benefits. This trust was subject to the requirements of the Welfare and Pension Plans Disclosure Act, which imposes specific requirements and duties as to reports and descriptions of plans. The administrator of these plans was required to deliver, upon request, to each participant or beneficiary covered therein, a description of the plan and an annual financial report, each setting forth detailed information prescribed by the statute. This information is also filed with the Secretary of Labor, and made available at the principal office of the plan. The question raised was whether these trusts are collective investments, and therefore subject to the requirements of section 9.18 of Regulation 9.

Consideration was given this question, as well as the allied question whether, if these trusts do constitute collective investment, application of the requirements of section 9.18 is necessary. The Comptroller concluded that, in view of the special circumstances surrounding the origin and operation of these trusts, and the fact that extensive disclosure requirements are imposed upon the purported collective investment vehicle by the provisions of the Welfare and Pension Plans Disclosure Act, they should be and are exempt from the requirements of Regulation 9 under the provisions of section 9.18 (c)(4) and (c)(5), to the degree that they may constitute collective investments.

Another recent ruling related to the applicability of section 9.18 of Regulation 9 to so-called "private placements." The Comptroller ruled that any investment on the part of two or more fiduciary accounts, either alone or with other entities, in a security, obligation, or other property, either real, personal, or mixed of a single issuer will be, under the authority of Section 9.18(c)(5), exempted from the requirements of Section 9.18 of Regulation 9. In issuing this exemption, it was noted that the provisions of Regulation 9 pertaining to collective investment of fiduciary funds apply to all forms of collective investment of assets held by a national bank as fiduciary and that, therefore, the requirements of Regulation 9 must be complied with in every case where assets of a fiduciary account are invested collectively with assets of another fiduciary account. However, it was also noted that a number of means of collective investment employed by national banks do not require the application of all the requirements found in Section 9.18(b). To require such an application would, in many cases, be unduly burdensome. Recognition of these facts is reflected in Regulation 9 itself, and in prior rulings of the Comptroller. For example, Section 9.18(c)(2) of Regulation 9 permits collective investment of fiduciary funds "in a single real estate loan, or a direct obligation of the United States, or an obligation fully guaranteed by the United States, if the bank owns no participation in the loan or obligation and has no interest therein except in its capacity as fiduciary." In addition, the Comptroller has by ruling exempted from the requirements of Regulation 9 a similar form of collective investment in variable amount notes, as was announced in this column in a previous edition of the *Review*.[49] For the same reasons as have premised the provisions of Section 9.18 (c)(2) and this prior ruling, the Comptroller deemed it advisable to enlarge the exemption for such means of collective investment.

XX. *International Banking*

It has been concluded by the Comptroller that there are no governmental prohibitions or restrictions existing which

[49] *The National Banking Review*, 2, December 1964, pp. 267-268.

would impede or prevent a national bank from establishing a ruble account with the Bank for Foreign Trade of the U.S.S.R., Moscow, Russia. Although applicable Federal law[50] prohibits certain private loans to nations (such as the Soviet Union) in default of their obligations to the United States, that law as interpreted by the Attorney General does not prevent a national bank from establishing a ruble account with The Bank for Foreign Trade of the U.S.S.R. However, this law does limit the purposes for which such an account could be created and the manner of its creation. The Comptroller thus held that there is no legal prohibition against the establishment of such a ruble account and that it is the policy of the Comptroller that the question of the establishment of such an account is one for the discretion of the board of directors of the national bank concerned.

The President, in his message on the balance of payments, requested the Chairman of the Board of Governors of the Federal Reserve System to work closely with the Secretary of the Treasury and the Nation's banks in a program that would sharply limit bank loans abroad. The Comptroller and the Federal Deposit Insurance Corporation are cooperating with the Federal Reserve System and the Treasury Department in this undertaking. National bank examiners have been directed to assist in the appraisal of the effectiveness of this program as a part of their regular examination of the commercial, foreign, and trust departments of each national bank which has loans and obligations of, or balances with, foreigners.

National bank examiners have been instructed to ascertain and report whether, and by what means, banks are following the guidelines furnished to the banks by the Board of Governors of the Federal Reserve System. Inasmuch as the program is voluntary, the examiners have been cautioned against efforts to require adherence to the guidelines. The examiners are, however, required to note the extent to which a bank holds foreign assets, any growth in this type of business, particularly in any banks not previously active in the field, and to observe whether any foreign assets are being sold to United States residents.

[50] 18 U.S.C. 955.

XXI. *Litigation Involving Decisions of the Comptroller*

Several suits have recently been instituted which contest the Comptroller's approval or possible approval of branch applications by national banks. In one case, the plaintiff state bank seeks a determination of whether a branch established immediately outside of a city subverted applicable branching laws. The state branching law[51] prohibits a bank from placing a branch inside of a city which does not have a population of more than 3,500 and which is already served by an existing bank or branch thereof. The plaintiff also seeks a determination of whether the Comptroller is required to hold formal hearings under the Administrative Procedure Act in approving and denying branch applications. *The Bank of Tupelo, Mississippi* v. *James J. Saxon, Comptroller of the Currency,* Civil Action No. E. C. 6514 (D. C. N. D. Miss.).

In another case, a state-chartered bank is contesting the proposed establishment of a branch of a national bank. It contends that the state branching law provides that a branch may not be established within one-fourth of a mile of another bank within such bank's home office city. *Hoosier State Bank of Indiana, Hammond, Indiana* v. *James J. Saxon, Comptroller of the Currency,* and *The*

[51] As incorporated into the Federal branching statute, 12 U.S.C. 36.

Calumet National Bank of Hammond, Hammond, Indiana, Civil Action No. 4111, (D. C. N. D. Ind.). A third case has been filed by a state-chartered bank to enjoin the issuance of a branch certificate by the Comptroller. *First-Citizens Bank and Trust Company* v. *James J. Saxon, Comptroller of the Currency of the United States,* Civil Action, File Number 928 (D. C. E. D. N. C.).

An action has been brought against a national bank which is operating a drive-in teller's window approximately one-half block away from one of its existing branches. The plaintiffs contend that this window constitutes a branch at a location at which the defendant bank may not lawfully establish a branch. The defendant contends that this drive-in teller's window is merely an extension of its nearby branch and that, in accordance with a ruling received from the Comptroller, the window does not constitute a separate branch for which a branch certificate or authorization must be issued. *State Chartered Banks in Washington, a Corporation, et al.* v. *Peoples National Bank of Washington,* Civil Action No. 6338 (D. C. W. D. Wash.).

XXII. *Other Litigation*

In an action by a national bank as an automobile seller's assignee to recover an automobile sold under a retail installment contract following defaults under the contract, it was contended in the defendant's motion to dismiss the complaint that the state corporation law provisions prohibiting a foreign corporation, other than a "moneyed corporation," from maintaining an action in New York upon contract without having obtained a certificate of authority, were applicable to national banks located in another state. However, the court denied the motion to dismiss and held that inasmuch as a national bank is brought into existence under federal legislation, it did not come within New York's statutory requirements limiting the right of foreign corporations to sue. The court stated that the National Bank Act provisions authorizing a national bank to institute an action in New York on a contract was paramount to New York statute, and that any New York statute would be unconstitutional if construed to require a national bank, brought into existence under federal legislaion, to obtain a New York certificate of authority to do business in New York as a prerequisite to suing as a foreign corporation on a contract in New York. *State National Bank of Connecticut* v. *Laura,* 256 N.Y.S. 2d 1004 (N.Y. 1965).

A national bank, in a wrongful-death action against it as the administrator of the estate of a person whose negligence was alleged to have caused the death of the plaintiff's decedent, failed in its effort to have further proceedings against it enjoined on the ground that the requirements of the Federal venue statute applicable to national banks[52] were not satisfied. That statute provides that suits against national banks must be brought in the Federal court of the district in which the national bank is established, or in any state, county, or municipal court having jurisdiction in similar cases in the county or city in which the national bank is located.[53] Although the state supreme court noted that state laws and rules of procedure may not defeat an asserted federal right which has been plainly and reasonably made, it held that the defendant national bank waived its right to change of venue, where the venue question was not raised in its answer, the bank permitted the note of issue and interrogatories to be served and filed without objection, and it initiated its own deposi-

[52] 12 U.S.C. 94.

[53] Other cases involving this statute and the question of venue in the case of national banks appeared in *The National Banking Review,* 1, September 1963, p. 145, and 2, March 1964, p. 434.

tion proceedings. The court stated that the right to change of venue is a personal privilege which must be asserted seasonably, and that a national bank in one state is deemed to have waived its venue rights as a matter of law if, after being sued in another state in November 1963, it interposes an answer and takes part in discovery proceedings without demanding a change of venue until the opening day of the April 1964 term of court. *Solum* v. *Farmers and Merchants National Bank*, 131 N.W. 2d 231 (Minn. 1964).

An action was brought in a New York state court by a judgment creditor to punish a Connecticut national bank for contempt for selling a judgment debtor's property in disregard of restraining notices, and for failing to respond to information subpoenas. The motions to punish the bank were denied, and the court stated that, for jurisdictional purposes, a national bank is a citizen of the state in which it is established and located, that statutory venue requirements relating to suits against national banks are mandatory, in the absence of a consent or waiver, and that, for venue purposes, a national bank is established or located only at its principal place of business and that only there may it be sued.

The court further stated that there can be no effective or valid service of a restraining order or information subpoena outside the state on a non-domiciliary foreign national bank, that the statutory immunity from suit in a foreign state granted to a national bank is pre-eminent over the jurisdiction and venue provisions of the state, and that, therefore, a Connecticut national bank could not be subjected to contempt proceedings based on process issued by a New York court to enforce a New York money judgment where the bank was not a party to the action. It was held by the court that, although a national bank may waive its exemption and privileges with respect to venue by failure to assert them or by its conduct, the plaintiff has the burden to show that a defendant national bank had waived its venue exemption and had submitted itself to jurisdiction. It was also held that the defendant Connecticut national bank did not waive its exemption from suit in New York by its acquisition of retail installment contracts from New York dealers and a public sale in New York of defaulted property. The court further held that the national bank did not waive its exemption from suit in New York by invoking the jurisdiction of a New York court in other unrelated actions, and that the national bank did not waive its exemption from suit in New York by making arguments relating to the merits and substance of the motions to punish it for contempt where, in each instance, the bank challenged jurisdiction. *Suil Realty Corp.* v. *Rye Motors, Inc.*, 257 N.Y.S. 2d 111 (N.Y. 1965).

In a proceeding for a review of a denial of a certificate of authority to operate a new savings and loan association, a state supreme court affirmed the decision of the state circuit court that the decision of the superintendent of banks was erroneous. The court stated that the burden of establishing that a decision of the state banking commission on an application for permission to engage in the banking business is incorrect and wrongful is on the party attacking the decision, and that a review of a circuit court judgment reversing a decision of the superintendent of banks denying an application for permission to transact business as a savings and loan association is not a review of the findings of fact, conclusions of law, and judgment of action tried to court, but is a review of action of the superintendent of banks without regard to the circuit court judgment. The supreme court further stated that the finding or conclusion of the superintendent of banks is clearly erroneous when, although there

may be some evidence to support it, the reviewing court is left with the definite and firm conviction that a mistake has been committed, and that such mistake amounts to an abuse of discretion. *State* v. *Brosz*, 131 N. W. 2d 69 (S.D. 1964).

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Table 1.—Number of national banks and banking offices, by states, March 31, 1965

State	National banks			Number of branches of national banks	Number of national banking offices‡
	Total	Unit	With branches		
United States†	4,789	3,527	1,262	8,083	12,872
Alabama	84	59	25	109	193
Alaska	5	0	5	38	43
Arizona	4	1	3	168	172
Arkansas	64	41	23	50	114
California	93	60	33	1,657	1,750
Colorado	117	117	0	0	117
Connecticut	27	11	16	155	182
Delaware	5	3	2	4	9
District of Columbia	8	0	8	46	54
Florida	191	191	0	0	191
Georgia	55	32	23	101	156
Hawaii	2	0	2	39	41
Idaho	9	4	5	90	99
Illinois	412	412	0	0	412
Indiana	125	64	61	245	370
Iowa	101	80	21	23	124
Kansas	169	145	24	24	193
Kentucky	82	41	41	115	197
Louisiana	47	17	30	126	173
Maine	22	8	14	63	85
Maryland	49	24	25	173	222
Massachusetts	94	34	60	306	400
Michigan	96	41	55	365	461
Minnesota	193	191	2	6	199
Mississippi	32	8	24	46	78
Missouri	94	80	14	14	108
Montana	48	48	0	0	48
Nebraska	125	109	16	16	141
Nevada	3	1	2	31	34
New Hampshire	50	32	18	20	70
New Jersey	145	52	93	394	539
New Mexico	33	16	17	46	79
New York	201	106	95	771	972
North Carolina	31	9	22	252	283
North Dakota	42	37	5	5	47
Ohio	222	101	121	475	697
Oklahoma	222	197	25	25	247
Oregon	12	7	5	200	212
Pennsylvania	378	232	146	734	1,112
Rhode Island	4	0	4	53	57
South Carolina	24	5	19	164	188
South Dakota	33	28	5	35	68
Tennessee	75	31	44	180	255
Texas	540§	540	0	0	540
Utah	13	9	4	54	67
Vermont	27	18	9	27	54
Virginia	124△	58	66	285	409
Washington	30	13	17	327	357
West Virginia	79	79	0	0	79
Wisconsin	109	97	12	24	133
Wyoming	38	38	0	0	38
Virgin Islands	1	0	1	2	3
D.C. – all*	15	1	14	79	94

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.

† Includes Virgin Islands.

‡ Number of banking offices is the sum of total national banks and number of branches of national banks.

§ Includes Deposit Insurance National Bank of Dell City, Dell City, Texas—organized under Section 11 of the Federal Deposit Insurance Act—to operate no longer than for a two year period.

△ Includes Deposit Insurance National Bank of Newport News, Newport News, Virginia—organized under Section 11 of the Federal Deposit Insurance Act—to operate no longer than for a two year period.

Table 2.—Total and principal assets of national banks, by states, December 31, 1964
(Dollar amounts in millions)

State	Number of banks	Assets								
		Total assets	Cash assets§	U. S. Government obligations, net△	State and local securities, net△	Other bonds, notes, net△	Loans and discounts, net△	Federal funds sold	Direct lease financing	Fixed assets
United States†	4,773	$190,113	$34,066	$33,537	$18,592	$2,237	$95,577	$821	$81	$2,789
Alabama	80	2,263	412	473	246	24	1,047	13	0	35
Alaska	5	256	42	61	21	9	113	2	0	8
Arizona	4	1,605	230	166	102	39	989	20	‡	34
Arkansas	63	1,060	226	176	128	19	489	1	‡	16
California	90	26,120	4,068	3,675	2,227	214	15,005	11	49	437
Colorado	115	2,154	407	400	140	8	1,121	17	1	44
Connecticut	27	1,728	305	222	230	4	920	‡	1	35
Delaware	5	24	3	6	‡	1	12	0	0	1
District of Columbia	8	1,305	252	324	66	3	626	3	0	21
Florida	187	4,934	1,132	1,068	377	83	2,097	15	‡	127
Georgia	55	2,429	548	338	151	17	1,309	2	2	48
Hawaii	2	376	58	54	35	1	210	0	0	12
Idaho	9	661	97	129	53	8	358	‡	0	12
Illinois	410	17,909	2,916	3,536	1,876	372	8,671	59	4	125
Indiana	124	4,290	820	973	333	67	1,981	35	1	52
Iowa	101	1,470	327	317	120	23	653	5	‡	18
Kansas	169	1,848	328	439	199	30	818	7	‡	20
Kentucky	82	1,505	335	315	136	23	670	0	‡	19
Louisiana	47	2,699	588	568	249	12	1,206	22	1	32
Maine	22	444	70	77	38	3	242	3	0	9
Maryland	49	1,846	332	369	152	24	923	12	0	21
Massachusetts	93	5,260	999	866	317	14	2,847	35	‡	62
Michigan	96	7,615	1,183	1,592	874	31	3,739	40	4	86
Minnesota	193	4,113	842	760	356	85	1,975	0	2	61
Mississippi	31	583	108	112	66	4	276	‡	0	13
Missouri	91	4,088	981	664	384	30	1,909	47	‡	38
Montana	48	592	86	130	52	10	298	0	‡	12
Nebraska	125	1,640	358	295*	136	28	793	‡	‡	20
Nevada	3	464	67	78	43	‡	253	0	0	17
New Hampshire	50	432	72	70	24	1	248	8	0	8
New Jersey	146	6,229	830	1,174	839	121	3,091	44	2	86
New Mexico	33	686	117	152	37	4	326	36	‡	11
New York	203	19,570	3,408	2,746	2,257	161	10,107	87	4	239
North Carolina	31	1,764	382	253	146	34	896	8	0	30
North Dakota	41	521	64	124	56	12	248	1	‡	11
Ohio	221	8,697	1,432	1,790	881	91	4,276	70	‡	106
Oklahoma	222	3,194	734	630	243	45	1,465	9	1	51
Oregon	11	2,530	425	413	198	57	1,334	10	‡	52
Pennsylvania	387	13,626	2,057	2,384	2,081	148	6,609	53	6	173
Rhode Island	4	738	72	87	166	4	391	4	0	8
South Carolina	25	944	191	184	58	19	462	5	0	19
South Dakota	33	583	81	147	41	11	287	1	0	11
Tennessee	75	3,645	770	658	332	32	1,773	9	0	47
Texas	539	13,992	3,265	2,341	1,154	171	6,551	67	‡	306
Utah	12	661	125	57	68	6	391	1	0	10
Vermont	28	266	32	51	17	3	155	2	0	4
Virginia	123	3,063	486	545	264	52	1,616	35	‡	50
Washington	28	3,371	600	573	279	26	1,773	10	0	59
West Virginia	79	980	164	293	75	10	409	10	0	15
Wisconsin	109	2,891	560	576	242	39	1,404	1	‡	48
Wyoming	38	421	78	101	25	4	197	4	‡	10
Virgin Islands	1	28	3	5	1	0	20	0	0	‡
D.C. – all*	15	2,310	423	547	99	9	1,183	4	0	29

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.
† Includes Virgin Islands.
‡ Less than $500,000.
§ Cash, balances with other banks, and cash items in process of collection.
△ Net of valuation reserves.
Note: Data may not add to totals because of rounding.

Table 3.—Total and principal liabilities of national banks, by states, December 31, 1964
(Dollar amounts in millions)

State	Liabilities						
	Total liabilities	Total deposits	Demand deposits, total	Time and savings deposits, total	Demand deposits, IPC§	Time deposits, IPC§	Federal funds purchased
United States†	$175,065	$169,617	$98,660	$70,957	$74,200	$64,763	$827
Alabama	2,077	2,038	1,314	724	992	694	0
Alaska	244	241	130	112	103	69	0
Arizona	1,476	1,437	763	674	587	649	0
Arkansas	977	966	662	304	480	292	0
California	24,325	23,459	10,728	12,732	8,776	11,180	55
Colorado	1,978	1,941	1,127	814	895	739	7
Connecticut	1,590	1,514	1,019	495	860	442	2
Delaware	21	21	11	10	10	10	0
District of Columbia	1,206	1,180	800	380	710	367	0
Florida	4,532	4,427	2,924	1,503	2,065	1,321	25
Georgia	2,203	2,140	1,556	584	1,100	527	0
Hawaii	343	337	185	152	125	120	0
Idaho	617	607	359	248	267	247	0
Illinois	16,514	16,118	9,161	6,958	6,734	6,539	104
Indiana	3,967	3,829	2,461	1,368	1,787	1,330	35
Iowa	1,357	1,346	930	417	644	408	0
Kansas	1,683	1,667	1,162	506	766	468	0
Kentucky	1,381	1,365	976	389	773	363	0
Louisiana	2,480	2,437	1,736	701	1,189	611	9
Maine	401	387	229	158	189	156	0
Maryland	1,694	1,652	1,065	588	834	542	2
Massachusetts	4,769	4,483	3,417	1,066	2,511	971	23
Michigan	7,117	6,950	3,434	3,516	2,674	3,124	0
Minnesota	3,796	3,720	2,219	1,501	1,503	1,432	10
Mississippi	536	528	361	167	248	161	‡
Missouri	3,739	3,650	2,597	1,053	1,714	981	32
Montana	551	538	299	239	235	226	0
Nebraska	1,503	1,469	1,074	395	740	387	‡
Nevada	428	418	242	177	176	166	1
New Hampshire	390	369	267	102	206	98	1
New Jersey	5,778	5,606	2,971	2,635	2,443	2,555	13
New Mexico	636	630	405	225	301	195	0
New York	17,950	16,856	9,457	7,399	6,993	6,664	187
North Carolina	1,618	1,568	1,058	509	818	401	0
North Dakota	484	475	254	221	213	212	0
Ohio	7,984	7,784	4,384	3,400	3,382	3,236	19
Oklahoma	2,894	2,852	1,992	860	1,446	817	9
Oregon	2,352	2,290	1,124	1,166	888	996	0
Pennsylvania	12,370	11,958	6,133	5,825	4,999	5,355	118
Rhode Island	685	646	255	391	208	360	20
South Carolina	870	837	699	138	560	123	0
South Dakota	541	531	293	238	235	215	0
Tennessee	3,381	3,293	2,028	1,265	1,308	1,150	17
Texas	12,867	12,539	8,417	4,122	5,900	3,518	128
Utah	607	596	312	284	221	263	2
Vermont	243	237	91	145	77	144	0
Virginia	2,811	2,738	1,540	1,198	1,207	1,120	4
Washington	3,116	3,034	1,769	1,265	1,390	1,257	6
West Virginia	887	871	526	346	398	344	0
Wisconsin	2,682	2,632	1,517	1,115	1,163	1,061	0
Wyoming	386	380	218	162	152	143	0
Virgin Islands	26	24	9	15	7	11	0
D.C. – all*	2,143	2,090	1,391	699	1,252	680	6

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.
† Includes Virgin Islands.
‡ Less than $500,000.
§ IPC deposits are those of individuals, partnerships, and corporations.
Note: Data may not add to totals because of rounding.

Table 4.—Selected loans and discounts of national banks, by states, December 31, 1964
(Dollar amounts in millions)

State	Loans and Discounts				
	Loans secured by real estate	Loans to financial institutions	Loans to purchase or carry securities	Commercial and industrial loans	Personal loans to individuals△
United States†	$24,065	$7,098	$2,878	$34,164	$22,715
Alabama	171	68	23	363	360
Alaska	48	0	‡	38	32
Arizona	266	59	10	270	226
Arkansas	108	18	6	159	146
California	5,160	1,185	189	4,977	2,921
Colorado	245	91	23	327	291
Connecticut	280	22	18	271	300
Delaware	5	0	0	2	4
District of Columbia	217	77	8	196	118
Florida	438	121	63	750	688
Georgia	218	93	16	504	450
Hawaii	90	2	4	47	49
Idaho	131	12	7	74	84
Illinois	1,388	1,018	530	3,943	1,457
Indiana	601	141	75	507	579
Iowa	169	33	10	152	141
Kansas	118	60	8	258	190
Kentucky	172	47	11	189	200
Louisiana	175	96	57	541	302
Maine	76	9	3	74	72
Maryland	272	73	22	273	258
Massachusetts	411	282	36	1,408	691
Michigan	1,340	266	80	898	1,067
Minnesota	508	188	68	677	398
Mississippi	54	8	6	94	89
Missouri	384	192	81	624	515
Montana	82	5	1	73	79
Nebraska	89	31	21	221	154
Nevada	90	7	‡	80	70
New Hampshire	59	10	2	85	85
New Jersey	1,283	119	132	704	861
New Mexico	68	10	5	119	95
New York	2,164	910	569	4,409	1,908
North Carolina	129	41	15	383	312
North Dakota	83	3	2	54	51
Ohio	1,345	242	129	1,085	1,320
Oklahoma	244	94	26	602	334
Oregon	363	99	8	506	281
Pennsylvania	1,956	336	141	2,393	1,529
Rhode Island	200	17	‡	100	59
South Carolina	65	25	25	149	175
South Dakota	75	10	1	58	56
Tennessee	249	172	56	686	569
Texas	653	423	286	3,126	1,565
Utah	150	31	16	102	69
Vermont	73	1	1	28	44
Virginia	454	67	21	444	581
Washington	456	158	15	619	380
West Virginia	147	13	5	89	153
Wisconsin	469	108	44	377	314
Wyoming	63	2	2	55	40
Virgin Islands	15	0	0	3	2
D.C. – all*	363	164	18	312	305

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.

† Includes Virgin Islands.

‡ Less than $500,000.

△ Excludes business and farm loans.

Note: Data may not add to totals because of rounding.

Table 5.—Capital accounts of national banks, by states, December 31, 1964
(Dollar amounts in millions)

State	Total capital accounts	Debentures	Preferred stock	Common stock	Surplus	Undivided profits	Reserves
United States†	$15,048	$475	$28	$4,286	$7,207	$2,657	$393
Alabama	185	0	0	57	77	39	13
Alaska	13	‡	0	5	4	3	1
Arizona	130	26	0	28	56	16	3
Arkansas	83	1	0	26	36	19	2
California	1,795	142	0	475	812	357	10
Colorado	176	3	0	59	76	37	2
Connecticut	138	0	0	41	76	20	1
Delaware	2	0	0	1	1	‡	‡
District of Columbia	99	0	0	29	50	17	3
Florida	402	13	‡	150	178	50	11
Georgia	226	37	0	46	91	29	23
Hawaii	33	0	0	9	14	8	2
Idaho	45	0	0	14	23	5	2
Illinois	1,395	9	0	487	656	200	43
Indiana	323	0	0	83	170	62	8
Iowa	113	0	0	31	54	26	2
Kansas	165	0	1	49	74	38	3
Kentucky	124	0	0	30	63	27	3
Louisiana	219	‡	3	52	129	34	1
Maine	42	0	0	16	15	11	1
Maryland	152	2	0	37	77	31	6
Massachusetts	491	0	0	116	288	78	8
Michigan	499	31	3	132	234	88	11
Minnesota	317	0	0	89	149	73	5
Mississippi	47	0	0	12	33	1	‡
Missouri	350	25	0	98	152	68	7
Montana	42	0	0	15	16	10	‡
Nebraska	137	0	0	40	57	37	4
Nevada	35	0	0	17	15	4	‡
New Hampshire	42	0	0	8	22	10	2
New Jersey	452	16	‡	132	224	69	11
New Mexico	49	0	0	18	18	1	11
New York	1,620	60	20	432	714	288	107
North Carolina	146	15	0	37	74	19	1
North Dakota	36	0	0	12	15	8	1
Ohio	713	22	‡	202	367	118	4
Oklahoma	300	18	0	83	118	77	4
Oregon	178	0	0	59	66	53	‡
Pennsylvania	1,255	17	‡	293	727	204	15
Rhode Island	52	0	0	14	30	9	0
South Carolina	74	0	‡	18	42	13	1
South Dakota	42	‡	0	15	17	9	‡
Tennessee	264	‡	‡	73	141	43	7
Texas	1,125	36	0	395	494	167	32
Utah	53	0	0	15	30	6	2
Vermont	23	‡	1	7	9	5	1
Virginia	253	0	0	77	134	39	3
Washington	255	0	0	77	112	65	2
West Virginia	93	0	0	22	47	18	5
Wisconsin	209	1	0	51	111	38	8
Wyoming	35	1	0	6	18	9	1
Virgin Islands	2	0	0	‡	1	1	0
D.C. – all*	167	0	0	44	91	26	6

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.

† Includes Virgin Islands.

‡ Less than $500,000.

Note: Data may not add to totals because of rounding.

Table 6.—U. S. Government obligations held by national banks, by states, December 31, 1964
(Dollar amounts in millions)

State	U. S. Government Obligations△							
	Treasury bills	Treasury notes	U. S. non-marketable bonds	Other U. S. bonds maturing within 1 year	Other U. S. bonds maturing 1–4.9 years	Other U. S. bonds maturing 5.0–9.9 years	U. S. bonds maturing after 10 years	Securities guaranteed by U. S. Government
United States†	$6,708	$10,043	$130	$991	$7,747	$7,318	$512	$89
Alabama	104	180	2	17	115	52	2	1
Alaska	18	7	2	2	12	19	1	0
Arizona	46	31	†	20	41	24	0	4
Arkansas	38	44	1	4	40	45	3	1
California	879	994	1	57	612	1,078	43	13
Colorado	121	110	1	19	98	47	3	‡
Connecticut	65	97	1	1	28	29	‡	‡
Delaware	1	1	‡	‡	2	2	0	0
District of Columbia	67	61	6	6	120	62	1	‡
Florida	172	324	2	59	189	308	9	3
Georgia	90	102	1	16	90	37	1	0
Hawaii	3	22	0	‡	25	4	0	0
Idaho	36	62	‡	‡	28	2	‡	1
Illinois	685	901	15	113	900	846	71	5
Indiana	163	345	4	44	259	153	5	‡
Iowa	63	94	2	8	96	53	1	‡
Kansas	98	124	3	20	113	75	6	‡
Kentucky	69	99	1	6	93	45	3	‡
Louisiana	53	256	1	4	158	82	12	1
Maine	23	29	1	1	10	12	‡	‡
Maryland	62	153	2	13	83	53	2	0
Massachusetts	323	273	5	8	98	154	4	1
Michigan	230	429	7	98	480	278	64	7
Minnesota	103	181	3	13	204	246	8	1
Mississippi	12	33	1	4	35	26	1	‡
Missouri	272	151	2	12	135	86	4	2
Montana	25	23	‡	3	38	39	1	‡
Nebraska	60	86	1	11	79	55	3	‡
Nevada	12	10	‡	15	15	26	0	0
New Hampshire	18	19	‡	1	20	11	1	‡
New Jersey	177	265	8	24	351	305	41	2
New Mexico	20	40	1	7	49	29	2	3
New York	596	976	6	46	437	638	37	11
North Carolina	65	78	1	2	54	52	1	0
North Dakota	12	25	1	2	39	45	1	‡
Ohio	471	586	6	43	314	345	23	3
Oklahoma	114	192	3	15	178	120	8	‡
Oregon	60	54	1	26	107	163	2	‡
Pennsylvania	358	798	11	44	514	585	72	2
Rhode Island	25	2	‡	0	45	14	1	0
South Carolina	27	38	3	22	59	33	‡	‡
South Dakota	29	40	1	4	37	36	1	‡
Tennessee	102	253	2	20	190	87	4	1
Texas	387	699	8	57	571	548	46	24
Utah	6	35	‡	‡	5	11	0	‡
Vermont	9	11	1	1	15	11	4	‡
Virginia	126	183	4	10	139	81	3	‡
Washington	28	216	2	57	173	90	7	‡
West Virginia	44	72	2	8	87	72	7	1
Wisconsin	112	212	2	15	140	91	4	1
Wyoming	27	25	1	12	24	12	2	‡
Virgin Islands	‡	2	‡	0	2	1	0	0
D.C. – all*	94	143	7	12	200	89	1	‡

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.
† Includes Virgin Islands.
‡ Less than $500,000.
△ Each category is net of valuation reserves.
Note: Data may not add to totals because of rounding.

Table 7.—Current operating revenue, expenses, and dividends of national banks, by major categories and states, year ended December 31, 1964
(Dollar amounts in millions)

State	Number of banks§	Current Operating Revenue								
		Interest and dividends on securities		Interest and discount on loans	Service charges and other fees on bank loans	Service charges on deposit accounts	Other service charges, commissions, fees and collection and exchange charges	Trust department	Other current operating revenue	Total current operating revenue
		U. S. Government obligations	Other securities							
United States†	4,773	$1,190	$602	$5,232	$94	$441	$133	$290	$165	$8,148
Alabama	80	16	8	63	1	7	2	3	1	101
Alaska	5	2	1	8	1	1	1	‡	‡	14
Arizona	4	6	3	60	2	6	2	2	1	82
Arkansas	63	6	4	28	‡	2	1	1	‡	43
California	90	134	78	867	25	94	19	42	29	1,289
Colorado	115	15	4	66	1	7	2	5	1	102
Connecticut	27	8	6	55	1	6	1	7	1	84
Delaware	5	‡	‡	1	‡	‡	‡	0	‡	1
Dist. of Col.	8	12	2	34	1	3	1	2	1	55
Florida	187	39	14	120	3	15	3	9	3	205
Georgia	55	12	5	78	2	10	3	5	1	116
Hawaii	2	2	1	13	‡	1	‡	0	‡	18
Idaho	9	4	2	22	1	3	1	‡	‡	33
Illinois	410	126	68	424	5	21	10	36	13	703
Indiana	124	35	11	107	1	9	3	6	3	176
Iowa	101	11	4	37	‡	3	1	2	1	59
Kansas	169	16	7	45	‡	5	1	1	1	76
Kentucky	82	11	5	37	1	3	‡	1	1	59
Louisiana	47	20	7	64	1	6	2	1	2	103
Maine	22	3	1	15	‡	1	‡	1	‡	22
Maryland	49	13	5	51	2	4	1	2	1	79
Massachusetts	93	[illegible]	10	156	3	14	10	12	9	242
Michigan	96	[illegible]	26	195	2	13	5	10	5	311
Minnesota	193	28	12	109	1	9	6	8	2	177
Mississippi	31	4	2	16	‡	2	1	‡	‡	26
Missouri	91	20	8	74	1	4	1	5	2	115
Montana	48	5	2	17	‡	2	1	‡	2	29
Nebraska	125	10	4	45	‡	4	1	2	1	67
Nevada	3	3	1	16	1	1	‡	1	‡	24
New Hampshire	50	3	1	15	‡	2	‡	‡	‡	22
New Jersey	146	41	27	169	3	17	3	8	4	272
New Mexico	33	6	1	21	‡	2	1	1	1	33
New York	203	100	72	531	9	34	10	29	38	823
North Carolina	31	8	5	53	2	5	3	2	1	79
North Dakota	41	5	2	15	‡	2	1	‡	‡	25
Ohio	221	63	28	229	3	18	4	12	5	362
Oklahoma	222	23	8	86	1	8	2	2	2	132
Oregon	11	13	6	81	1	10	1	3	2	118
Pennsylvania	387	85	63	339	4	18	6	28	9	554
Rhode Island	4	3	5	21	‡	2	1	2	‡	33
South Carolina	25	6	2	27	‡	3	1	1	1	42
South Dakota	33	5	2	19	‡	2	1	‡	‡	29
Tennessee	75	22	10	100	1	6	2	3	2	147
Texas	539	82	39	362	6	22	8	15	8	542
Utah	12	3	2	23	1	2	1	1	‡	32
Vermont	28	2	1	9	‡	1	‡	‡	‡	13
Virginia	123	19	9	95	2	8	2	5	2	141
Washington	28	21	9	107	2	14	3	5	3	165
West Virginia	79	11	2	25	‡	1	1	1	1	41
Wisconsin	109	22	8	70	1	5	2	3	3	112
Wyoming	38	3	1	13	‡	1	1	‡	‡	19
Virgin Islands	1	‡	‡	1	‡	‡	‡	0	‡	2
D.C. – all*	15	20	3	64	1	6	1	6	1	103

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.
† Includes Virgin Islands.
‡ Less than $500,000.
§ Number of banks as of end of year, but figures of income, expenses, etc., include banks which were in operation a part of the year but were inactive at the close of the year.
Note: Data may not add to totals because of rounding.

Table 7.—Current operating revenue, expenses, and dividends of national banks, by major categories and states, year ended December 31, 1964—Continued
(Dollar amounts in millions)

State	Current Operating Expenses													
	Salaries and wages				Officer and employee benefits (pensions, hospitalization, social security, insurance, etc.)	Fees paid to directors and members of executive, discount, and other committees	Interest on time and savings deposits	Interest and discount on borrowed money	Net occupancy expense of bank premises	Furniture and equipment (depreciation, rents, servicing, uncapitalized costs, etc.)	Other current operating expenses	Total current operating expenses	Net current operating earnings○
	Officers		Employees other than officers										
	Amount	Number§	Amount	Number△									
United States†	$665	62,775	$1,211	312,470	$266	$33	$2,263	$20	$351	$206	$890	$5,905	$2,243
Alabama	9	873	15	4,371	3	‡	24	‡	3	2	12	70	31
Alaska	2	114	3	534	‡	‡	3	‡	1	1	2	11	3
Arizona	7	692	14	3,517	3	‡	23	‡	4	3	9	63	19
Arkansas	5	494	6	1,751	1	‡	10	‡	2	1	6	31	13
California	97	9,579	207	46,226	41	1	429	2	57	34	106	974	314
Colorado	10	971	15	3,845	3	1	28	‡	5	3	12	79	24
Connecticut	8	727	16	3,938	4	‡	15	‡	5	3	10	63	22
Delaware	‡	21	‡	62	‡	‡	‡	0	‡	‡	‡	1	‡
Dist. of Col.	5	358	8	1,838	1	‡	11	‡	2	2	6	35	20
Florida	20	1,922	35	9,515	6	1	47	1	9	8	28	155	51
Georgia	11	1,004	20	5,490	5	1	18	‡	7	4	18	84	32
Hawaii	2	134	3	627	1	‡	5	0	1	1	2	13	5
Idaho	3	301	5	1,420	1	‡	8	‡	1	1	3	22	11
Illinois	47	3,870	92	20,991	24	3	225	2	23	13	66	495	208
Indiana	17	1,527	27	7,113	6	1	38	‡	8	5	24	126	50
Iowa	7	695	8	2,269	2	‡	13	‡	3	2	8	43	16
Kansas	10	995	9	2,545	2	1	16	‡	3	2	8	51	26
Kentucky	6	681	8	2,494	2	‡	11	‡	3	2	7	40	19
Louisiana	9	717	16	4,079	3	1	21	‡	5	3	15	72	31
Maine	2	231	4	1,056	1	‡	5	‡	1	1	3	16	6
Maryland	6	639	13	3,587	3	‡	18	‡	4	2	10	57	22
Massachusetts	20	1,702	43	10,443	9	1	34	1	12	7	28	155	87
Michigan	17	1,390	47	12,080	11	1	111	1	13	7	33	240	71
Minnesota	16	1,535	25	18,034	6	1	48	‡	8	5	20	129	48
Mississippi	2	254	4	1,007	1	‡	5	‡	1	1	4	18	8
Missouri	10	1,064	18	5,741	4	1	25	‡	5	3	13	78	37
Montana	3	313	4	1,028	1	‡	7	‡	1	1	4	21	8
Nebraska	9	834	9	2,524	2	1	12	‡	3	2	9	47	20
Nevada	2	252	4	920	1	‡	5	0	2	1	2	17	7
New Hampshire	2	269	3	965	1	‡	4	‡	1	1	3	16	6
New Jersey	21	1,914	45	11,498	9	2	78	1	14	7	30	207	65
New Mexico	3	331	5	1,487	1	‡	7	‡	1	1	5	25	9
New York	50	4,110	120	25,765	32	2	256	1	40	16	83	602	222
North Carolina	8	797	13	3,780	3	‡	15	‡	4	3	10	56	23
North Dakota	3	281	3	882	1	‡	7	‡	1	1	3	18	7
Ohio	27	2,319	52	12,980	9	2	97	‡	13	8	46	254	43
Oklahoma	15	1,573	17	4,581	4	1	29	‡	5	3	15	89	29
Oregon	12	1,301	18	4,366	4	‡	36	‡	5	3	11	89	29
Pennsylvania	40	4,074	74	19,431	18	4	171	1	22	13	62	405	148
Rhode Island	2	184	4	1,188	2	‡	14	‡	1	1	3	27	6
South Carolina	5	532	9	2,562	2	‡	3	‡	2	2	6	28	14
South Dakota	3	352	4	1,010	1	‡	8	‡	1	1	3	21	9
Tennessee	11	1,111	20	5,401	4	‡	44	‡	6	4	16	106	41
Texas	51	4,895	64	16,895	14	3	137	5	23	13	71	381	160
Utah	2	228	4	1,080	1	‡	10	‡	1	1	3	22	10
Vermont	1	148	2	531	‡	‡	5	‡	1	‡	1	11	3
Virginia	13	1,360	20	5,717	4	1	37	‡	5	4	17	101	40
Washington	15	1,470	29	6,693	5	‡	41	‡	8	5	16	120	45
West Virginia	4	410	5	1,481	1	‡	10	‡	1	1	5	27	14
Wisconsin	10	995	15	4,376	3	1	32	‡	5	3	12	81	30
Wyoming	2	222	3	685	1	‡	5	‡	1	1	2	14	5
Virgin Islands	‡	10	‡	71	‡	‡	‡	‡	‡	‡	‡	1	‡
D.C. – all*	8	605	15	3,522	2	1	21	‡	5	2	12	67	36

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.
† Includes Virgin Islands.
‡ Less than $500,000.
§ Number at end of period. Excludes building officers.
△ Number of employees at end of period. Excludes building employees.
○ Total current operating revenue less total current operating expenses.
Note: Data may not add to totals because of rounding.

Table 7.—Current operating revenue, expenses, and dividends of national banks, by major categories and states, year ended December 31, 1964—Continued
(Dollar amounts in millions)

State	Recoveries, Transfers from Valuation Reserves, and Profits §							Losses, Charge-offs, and Transfers to Valuation Reserves △						
	On securities			On loans		All other	Total recoveries, transfers from valuation reserves, and profits	On securities			On loans		All other	Total losses, charge-offs, and transfers to valuation reserves
	Profits on securities sold or redeemed	Recoveries	Transfers from valuation reserves	Recoveries	Transfers from valuation reserves			Losses on securities sold	Charge-offs on securities not sold	Transfers to valuation reserves	Losses and Charge-offs	Transfers to valuation reserves		
UNITED STATES†	$43	$2	$39	$8	$19	$58	$169	$50	$4	$41	$13	$366	$82	$557
Alabama	1	‡	‡	‡	‡	‡	2	‡	‡	‡	‡	5	1	7
Alaska	‡	0	0	0	0	‡	‡	‡	0	0	0	1	‡	1
Arizona	1	0	‡	0	0	‡	1	‡	0	‡	0	4	‡	4
Arkansas	‡	‡	‡	‡	‡	‡	1	‡	‡	‡	‡	2	1	3
California	4	‡	3	‡	‡	2	10	7	‡	11	‡	52	17	87
Colorado	‡	‡	‡	‡	‡	‡	1	1	‡	‡	1	3	1	5
Connecticut	‡	0	‡	‡	‡	1	1	1	0	‡	‡	3	2	6
Delaware	‡	0	0	‡	0	‡	‡	0	‡	0	‡	0	‡	‡
Dist. of Col.	‡	0	0	‡	‡	‡	‡	1	0	0	‡	1	‡	2
Florida	1	‡	‡	1	‡	‡	3	1	‡	‡	1	9	1	12
Georgia	‡	‡	‡	‡	‡	3	3	1	‡	‡	‡	3	1	5
Hawaii	‡	0	0	0	0	1	1	‡	0	0	0	‡	‡	1
Idaho	‡	‡	‡	‡	‡	‡	‡	‡	‡	0	‡	1	‡	2
Illinois	6	‡	15	1	1	1	24	5	‡	9	1	57	6	77
Indiana	1	‡	2	‡	‡	1	4	1	‡	2	‡	6	3	13
Iowa	‡	‡	‡	‡	‡	1	2	‡	‡	‡	‡	2	1	3
Kansas	‡	‡	‡	‡	‡	‡	1	‡	‡	‡	1	2	1	4
Kentucky	‡	‡	‡	‡	‡	‡	1	‡	‡	‡	‡	2	1	3
Louisiana	2	‡	‡	‡	‡	‡	3	‡	‡	1	‡	3	1	6
Maine	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	1	‡	1
Maryland	‡	‡	‡	‡	‡	7	7	‡	‡	‡	‡	1	1	3
Massachusetts	4	‡	9	‡	1	8	22	2	‡	1	‡	15	9	27
Michigan	1	‡	‡	‡	3	1	5	‡	‡	1	‡	15	4	21
Minnesota	1	‡	‡	‡	‡	2	4	‡	‡	‡	‡	4	1	6
Mississippi	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	1	‡	2
Missouri	1	‡	1	‡	1	1	4	1	‡	1	‡	3	1	6
Montana	‡	‡	‡	‡	‡	‡	1	‡	‡	‡	‡	1	‡	2
Nebraska	1	‡	‡	‡	‡	1	2	‡	‡	1	‡	2	1	4
Nevada	‡	0	‡	0	0	‡	‡	‡	0	‡	0	1	1	2
New Hampshire	‡	‡	0	‡	‡	‡	1	‡	‡	‡	‡	1	‡	1
New Jersey	2	‡	‡	‡	1	1	4	1	‡	‡	1	16	2	20
New Mexico	‡	‡	‡	‡	‡	‡	1	‡	‡	‡	‡	3	‡	3
New York	2	‡	‡	‡	3	5	11	6	‡	1	‡	42	5	55
North Carolina	‡	‡	‡	‡	‡	2	2	‡	‡	‡	‡	3	1	4
North Dakota	‡	‡	0	‡	‡	‡	‡	‡	‡	0	‡	1	‡	1
Ohio	1	‡	1	‡	1	1	4	3	‡	1	‡	11	2	17
Oklahoma	1	‡	‡	1	‡	2	4	‡	‡	‡	2	7	1	10
Oregon	‡	0	1	‡	0	1	2	2	0	1	‡	3	1	8
Pennsylvania	2	‡	1	‡	1	3	8	6	‡	2	1	23	4	36
Rhode Island	‡	0	‡	‡	0	‡	‡	‡	0	‡	‡	1	‡	1
South Carolina	‡	‡	‡	‡	0	‡	‡	‡	‡	0	‡	2	1	2
South Dakota	‡	‡	0	‡	0	‡	‡	‡	‡	‡	‡	1	‡	1
Tennessee	2	‡	‡	‡	3	‡	6	1	‡	‡	‡	7	3	12
Texas	2	‡	1	1	1	6	12	3	‡	7	3	25	5	43
Utah	‡	0	0	‡	‡	‡	‡	‡	0	0	‡	‡	‡	1
Vermont	‡	0	0	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	1
Virginia	‡	‡	1	‡	‡	1	2	1	‡	1	‡	5	1	8
Washington	1	‡	‡	‡	1	‡	3	‡	‡	1	‡	5	1	7
West Virginia	‡	‡	‡	‡	‡	‡	1	‡	‡	‡	‡	2	‡	2
Wisconsin	1	‡	‡	‡	‡	2	3	1	‡	‡	‡	5	‡	6
Wyoming	‡	‡	0	‡	‡	‡	‡	‡	‡	‡	‡	1	‡	1
Virgin Islands	0	0	0	0	0	‡	‡	0	0	0	0	‡	‡	‡
D.C. – all*	‡	‡	0	‡	‡	‡	‡	1	0	‡	‡	1	1	3

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.
† Includes Virgin Islands.
‡ Less than $500,000.
§ Not including recoveries credited to valuation reserves.
△ Not including losses charged to valuation reserves.
Note: Data may not add to totals because of rounding.

Table 7.—Current operating revenue, expenses, and dividends of national banks, by major categories and states, year ended December 31, 1964—Continued
(Dollar amounts in millions)

State	Net income before related taxes	Taxes on net income		Net income before dividends	Cash dividends declared			Net income after dividends	Capital accounts §	Ratios		Memoranda Items			
		Federal	State		On common stock	On preferred stock	Total cash dividends declared			Net income before dividends to capital accounts (Percent)	Total current operating expenses to total current operating revenue (Percent)	Recoveries credited to valuation reserves (not included in recoveries, p. 600)		Losses charged to valuation reserves (not included in losses, p. 600)	
												On securities	On loans	On securities	On loans
United States†	$1,855	$580	$51	$1,213△	$591	$1	$593	$620	$14,298	8.48	72.47	$3	$106	$32	$226
Alabama	25	8	1	16	7	0	7	9	179	8.94	69.31	0	1	‡	4
Alaska	2	1	‡	1	‡	0	‡	1	13	7.69	78.57	0	‡	0	1
Arizona	16	6	‡	9	5	0	5	4	110	8.18	76.83	0	1	0	3
Arkansas	11	3	0	8	2	0	2	5	79	10.13	72.09	0	‡	‡	1
California	237	69	22	142	92	0	92	50	1,679	8.52	75.56	‡	9	19	35
Colorado	20	7	1	12	6	0	6	6	169	7.10	77.45	‡	2	0	3
Connecticut	16	5	1	11	6	0	6	5	132	8.33	75.00	0	1	‡	2
Delaware	‡	‡	‡	‡	‡	0	‡	‡	2	4.65	87.45	0	‡	0	0
Dist. of Col.	18	8	0	10	5	0	5	5	96	10.42	63.64	0	2	0	1
Florida	41	14	0	27	11	‡	11	16	377	7.16	75.61	‡	2	‡	10
Georgia	30	10	0	19	7	0	7	12	202	9.41	72.41	‡	2	‡	4
Hawaii	5	1	‡	3	1	0	1	2	32	9.37	72.22	0	‡	0	‡
Idaho	9	3	1	5	2	0	2	3	44	11.36	66.67	0	1	0	‡
Illinois	155	47	0	108	50	0	50	58	1,356	7.96	70.41	2	17	2	22
Indiana	41	16	0	25	10	0	10	15	315	7.94	71.59	‡	3	‡	5
Iowa	15	5	0	10	4	0	4	6	110	9.09	72.88	‡	1	‡	1
Kansas	23	7	1	15	5	‡	5	10	160	9.37	67.10	‡	‡	‡	2
Kentucky	17	5	0	11	4	0	4	7	121	9.09	67.80	‡	1	1	1
Louisiana	28	11	0	17	6	‡	7	11	211	8.06	69.90	0	1	‡	2
Maine	5	2	0	3	1	0	1	2	41	7.32	72.73	‡	‡	‡	1
Maryland	27	8	0	19	6	0	6	13	143	13.29	72.15	0	2	‡	1
Massachusetts	81	28	6	48	23	0	23	25	475	10.11	64.05	‡	3	1	9
Michigan	55	15	0	39	18	‡	18	21	461	8.68	77.17	‡	5	1	8
Minnesota	46	15	3	28	13	0	13	15	308	9.09	72.88	0	2	0	4
Mississippi	7	2	0	5	2	0	2	3	45	11.11	69.23	0	1	0	1
Missouri	35	13	1	21	8	0	8	13	276	7.61	67.83	0	1	‡	1
Montana	7	2	0	5	2	0	2	2	41	12.20	72.41	‡	‡	‡	1
Nebraska	18	7	0	11	5	0	5	6	133	8.27	70.15	‡	1	‡	2
Nevada	6	2	0	4	2	0	2	1	33	12.12	70.83	0	‡	0	1
New Hampshire	5	2	0	3	1	0	1	2	41	7.32	72.73	0	‡	0	1
New Jersey	49	12	0	37	17	‡	17	19	427	8.67	76.10	‡	2	‡	6
New Mexico	6	2	0	4	2	0	2	2	48	8.33	75.76	‡	‡	‡	2
New York	177	42	8	125	63	1	64	61	1,540	8.12	73.15	‡	18	2	32
North Carolina	21	7	‡	13	6	0	6	7	137	9.49	70.89	‡	‡	‡	1
North Dakota	5	2	‡	4	2	0	2	2	35	11.43	72.00	0	‡	0	‡
Ohio	95	34	0	61	26	‡	26	35	675	9.04	70.17	‡	4	1	6
Oklahoma	37	13	1	23	12	0	12	11	288	7.64	67.42	0	2	0	5
Oregon	23	7	2	14	8	0	8	6	174	8.05	75.42	0	1	‡	2
Pennsylvania	121	26	0	94	49	0	49	44	1,185	7.85	73.10	‡	6	3	12
Rhode Island	5	‡	‡	4	3	0	3	2	51	7.84	81.82	0	‡	0	‡
South Carolina	12	5	‡	7	3	‡	3	4	72	9.72	66.67	‡	‡	0	‡
South Dakota	8	3	‡	5	2	0	2	3	40	12.50	72.41	0	‡	‡	1
Tennessee	35	12	0	23	9	0	9	14	255	9.02	72.11	0	1	‡	4
Texas	130	46	0	84	45	0	45	39	1,090	7.71	70.30	‡	7	2	21
Utah	10	4	‡	6	3	0	3	3	52	11.54	68.75	0	‡	0	‡
Vermont	2	1	‡	2	1	‡	1	1	23	8.70	84.62	0	‡	0	‡
Virginia	34	13	0	21	10	0	10	11	246	8.54	71.63	‡	1	1	3
Washington	41	16	0	25	11	0	11	14	248	10.08	72.73	0	1	0	2
West Virginia	13	5	0	8	3	0	3	5	91	8.79	65.85	0	‡	‡	1
Wisconsin	27	8	1	18	8	0	8	9	201	8.96	72.32	0	1	0	2
Wyoming	4	2	0	2	1	0	1	1	33	6.06	73.68	0	‡	0	‡
Virgin Islands	‡	‡	0	‡	0	0	0	‡	2	14.04	72.01	0	‡	0	‡
D.C. – all*	33	15	0	18	8	0	8	9	161	11.18	65.05	0	2	0	1

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.
† Includes Virgin Islands.
‡ Less than $500,000.
§ Represents aggregate book value of capital stock, surplus, undivided profits, reserves, and retirement fund for preferred stock. Figures are averages of amounts reported for the June and December call date in the current year and the December call date in the previous year.
△ This figure is after deduction of $10 million, interest paid on capital notes and debentures.
Note: Data may not add to totals because of rounding.

Table 8.—Status of applications for national bank charters, and charters issued, January 1-March 31, 1965

Applications carried over from December 31, 1964		81
	1 Conversions	
	80 Primary	
Applications received January 1-March 31, 1965		69
	9 Conversions	
	60 Primary	
		150
Applications approved January 1-March 31, 1965		10
	4 Conversions	
	6 Primary	
Applications rejected January 1-March 31, 1965		47
	0 Conversions	
	47 Primary	
Applications abandoned January 1-March 31, 1965		13
	0 Conversions	
	13 Primary	
Applications pending as of March 31, 1965		80
	6 Conversions	
	74 Primary	
		150
National banks chartered January 1-March 31, 1965		32
	5 Conversions	
	27 Primary	

* * * * *

Table 9.—Status of applications for national bank charters,* and charters issued,* by states, January 1-March 31, 1965

State	Received‡	Approved	Rejected	Abandoned	Pending March 31, 1965	Charters Issued
United States†	150	10	47	13	80	32
Alabama	2	0	1	0	1	4
Alaska	0	0	0	0	0	0
Arizona	0	0	0	0	0	0
Arkansas	4	1	1	0	2	1
California	23	0	18	4	1	5
Colorado	2	0	1	0	1	3
Connecticut	7	1	5	0	1	2
Delaware	0	0	0	0	0	0
District of Columbia	0	0	0	0	0	0
Florida	14	0	7	0	7	4
Georgia	3	0	0	0	3	0
Hawaii	3	0	1	1	1	0
Idaho	0	0	0	0	0	0
Illinois	8	1	1	1	5	1
Indiana	0	0	0	0	0	1
Iowa	3	0	0	1	2	0
Kansas	2	0	0	0	2	0
Kentucky	1	0	0	1	0	0
Louisiana	2	0	0	0	2	0
Maine	0	0	0	0	0	0
Maryland	2	0	1	0	1	0
Massachusetts	2	0	2	0	0	1
Michigan	5	0	0	1	4	0
Minnesota	1	0	0	0	1	0
Mississippi	7	0	0	0	7	1
Missouri	6	1	1	1	3	2
Montana	4	0	0	0	4	0
Nebraska	1	0	0	0	1	0
Nevada	1	0	0	0	1	0
New Hampshire	0	0	0	0	0	0
New Jersey	4	1	0	0	3	0
New Mexico	2	0	0	0	2	0
New York	4	0	1	0	3	0
North Carolina	0	0	0	0	0	0
North Dakota	0	0	0	0	0	0
Ohio	5	1	1	0	3	1
Oklahoma	6	0	1	2	3	0
Oregon	0	0	0	0	0	1
Pennsylvania	0	0	0	0	0	0
Rhode Island	0	0	0	0	0	0
South Carolina	2	0	0	0	2	0
South Dakota	0	0	0	0	0	0
Tennessee	4	0	1	0	3	0
Texas	7	3	2	0	2	1
Utah	1	0	0	0	1	1
Vermont	0	0	0	0	0	0
Virginia	3	1	0	1	1	1
Washington	3	0	0	0	3	2
West Virginia	1	0	0	0	1	0
Wisconsin	0	0	0	0	0	0
Wyoming	3	0	1	0	2	0
Virgin Islands	1	0	0	0	1	0
Puerto Rico	1	0	1	0	0	0

* Includes conversions.
† Includes Virgin Islands and Puerto Rico.
‡ Includes applications pending as of December 31, 1964.

Table 10.—Status of de novo branch applications of national banks, by states, January 1-March 31, 1965

State	Received‡	Approved	Rejected	Abandoned	Pending March 31, 1965
United States†	393	144	39	6	204
Alabama	10	6	1	0	3
Alaska	1	0	0	0	1
Arizona	6	2	2	0	2
Arkansas	4	2	0	0	2
California	61	18	18	1	24
Colorado	0	0	0	0	0
Connecticut	9	3	2	0	4
Delaware	0	0	0	0	0
District of Columbia	2	1	0	0	1
Florida	0	0	0	0	0
Georgia	2	0	0	0	2
Hawaii	1	1	0	0	0
Idaho	5	1	2	0	2
Illinois	0	0	0	0	0
Indiana	5	1	1	0	3
Iowa	6	2	0	0	4
Kansas	0	0	0	0	0
Kentucky	6	1	0	1	4
Louisiana	7	5	0	0	2
Maine	5	2	1	0	2
Maryland	9	6	0	0	3
Massachusetts	14	5	2	0	7
Michigan	33	15	0	0	18
Minnesota	0	0	0	0	0
Mississippi	3	1	0	0	2
Missouri	0	0	0	0	0
Montana	0	0	0	0	0
Nebraska	0	0	0	0	0
Nevada	2	1	0	0	1
New Hampshire	2	2	0	0	0
New Jersey	23	7	3	1	12
New Mexico	2	0	0	0	2
New York	42	10	3	0	29
North Carolina	10	3	0	0	7
North Dakota	1	0	0	0	1
Ohio	21	9	0	0	12
Oklahoma	2	1	0	0	1
Oregon	2	1	0	0	1
Pennsylvania	35	18	1	2	14
Rhode Island	1	1	0	0	0
South Carolina	11	7	0	0	4
South Dakota	2	0	0	0	2
Tennessee	12	4	0	0	8
Texas	0	0	0	0	0
Utah	3	1	0	0	2
Vermont	3	3	0	0	0
Virginia	24	3	2	1	18
Washington	6	1	1	0	4
West Virginia	0	0	0	0	0
Wisconsin	0	0	0	0	0
Wyoming	0	0	0	0	0
Virgin Islands	0	0	0	0	0
D.C. - all*	4	2	1	0	1

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.

† Includes Virgin Islands.

‡ Includes applications pending as of December 31, 1964.

Table 11.—Branches of national banks: in operation December 31, 1964; opened, discontinued, or consolidated, January 1-March 31, 1965; and branches in operation March 31, 1965

State	Branches in operation Dec. 31, 1964	Branches opened for business Jan. 1-Mar. 31, 1965	Existing branches discontinued or consolidated Jan. 1-Mar. 31, 1965	Branches in operation Mar. 31, 1965
United States†	7,960‡	134	11	8,083
Alabama	106	3	0	109
Alaska	38	0	0	38
Arizona	166	2	0	168
Arkansas	47	3	0	50
California	1,648‡	15	6	1,657
Colorado	0	0	0	0
Connecticut	152	3	0	155
Delaware	3	1	0	4
District of Columbia	45	1	0	46
Florida	0	0	0	0
Georgia	100	1	0	101
Hawaii	39	0	0	39
Idaho	90	0	0	90
Illinois	0	0	0	0
Indiana	244	1	0	245
Iowa	23	1	1	23
Kansas	24	0	0	24
Kentucky	110	5	0	115
Louisiana	126	0	0	126
Maine	62	1	0	63
Maryland	171	2	0	173
Massachusetts	303	3	0	306
Michigan	355	10	0	365
Minnesota	6	0	0	6
Mississippi	42	4	0	46
Missouri	14	0	0	14
Montana	0	0	0	0
Nebraska	16	0	0	16
Nevada	30	1	0	31
New Hampshire	17	3	0	20
New Jersey	390	5	1	394
New Mexico	46	0	0	46
New York	755	17	1	771
North Carolina	248	4	0	252
North Dakota	5	0	0	5
Ohio	465	10	0	475
Oklahoma	23	2	0	25
Oregon	199‡	1	0	200
Pennsylvania	724	12	2	734
Rhode Island	52	1	0	53
South Carolina	161	3	0	164
South Dakota	34	1	0	35
Tennessee	179	1	0	180
Texas	0	0	0	0
Utah	53	1	0	54
Vermont	27	0	0	27
Virginia	274‡	11	0	285
Washington	322‡	5	0	327
West Virginia	0	0	0	0
Wisconsin	24	0	0	24
Wyoming	0	0	0	0
Virgin Islands	2	0	0	2
D.C. – all*	78	1	0	79

* Includes national and nonnational banks in the District of Columbia, all of which are supervised by the Comptroller of the Currency.
† Includes Virgin Islands.
‡Revised.

Table 12.—Branches of national banks opened for business, by community size and size of bank, January 1-March 31, 1965

Category	January 1-March 31, 1965
In cities with population:	
Less than 5,000	38
5,000 to 24,999	54
25,000 to 49,999	15
50,000 to 99,999	10
100,000 to 249,999	10
250,000 to 499,999	1
500,000 to 1,000,000	1
over 1,000,000	5
TOTAL	134
By banks with total resources (In millions of dollars)	
Less than $ 10.0	24
10.0 to 24.9	24
25.0 to 49.9	14
50.0 to 99.9	11
100.0 to 999.9	35
over 1,000	26
TOTAL	134

Table 13.—Mergers,* January 1-March 31, 1965

Applications carried over from December 31, 1964	15
Applications received January 1-March 31, 1965	25
Disposition of applications: January 1-March 31, 1965	
Approved	18
Withdrawn	0
Pending March 31, 1965	22
Transactions completed—Total	16
Mergers	14
Consolidations	1
Purchase of assets	1

The aggregate total of capital stock and capital accounts for certificates issued are as follows:

	Charter or purchasing bank	Merg., Consol. or selling bank	Combined
Capital stock	$109,177,157	$ 3,180,360	$113,730,917
Capital accounts	420,896,879†	14,200,856	434,184,465†

* Includes mergers, consolidations, and purchase and sale transactions where the emerging bank is a national bank.

† Includes debentures of $42.5 million.

Table 14.—Foreign branches of national banks, by region and country, March 31, 1965

Region and country	Number	Region and country	Number
LATIN AMERICA	68	**AFRICA**	1
Argentina	17	Nigeria	1
Bahamas	1		
Brazil	15	**NEAR EAST**	4
Chile	2		
Colombia	5	Lebanon	2
Dominican Republic	1	Saudi Arabia	1
Ecuador	2	Dubai	1
El Salvador	1		
Guatemala	2	**FAR EAST**	36
Jamaica	1		
Mexico	5	Hong Kong	5
Nicaragua	1	India	5
Panama	5	Japan	10
Paraguay	2	Malaysia	5
Peru	2	Okinawa	1
Uruguay	2	Pakistan	2
Venezuela	4	Phillipines	5
		Taiwan	2
CONTINENTAL EUROPE	12	Thailand	1
Belgium	1		
France	2	**U. S. OVERSEAS AREAS**	14
Germany	3		
Greece	1	Canal Zone	1
Italy	1	Guam	1
Netherlands	3	Puerto Rico	11
Switzerland	1	Truk Islands	1
ENGLAND	9	TOTAL	144

Table 15.—Foreign branches of national banks, 1955-1964

End of Year	Number of branches operated by national banks	National bank branches as a percentage of total foreign branches of U.S. banks
1955	85	76.6
1960	93	75.0
1961	102	75.6
1962	111	76.6
1963	124	77.5
1964	138	76.7

Table 16.—Assets and liabilities of foreign branches of national banks, Dec. 31, 1964: consolidated statement

(Dollar amounts in thousands)

Assets		Liabilities	
Loans and discounts	$1,924,827	Demand deposits of individuals, partnerships, and corporations	$ 730,761
Securities	178,958	Time and savings deposits of individuals, partnerships, and corporations	1,178,987
Currency and coin	31,331	Deposits of U.S. Government	190,932
Balances with other banks and cash items in process of collection	480,730	State and municipal deposits	12,988
Due from head office and branches	320,858	Deposits of banks	753,791
Fixed assets	28,352	Other deposits (certified and officers' checks, etc.)	21,468
Customers' liability on acceptances	304,362	Total deposits	2,888,927
Other assets	50,461	Due to head office and branches	8,591
Total assets	$3,319,879	Rediscounts and other liabilities for borrowed money	61,015
		Acceptances executed by or for account of reporting branches and outstanding	305,481
		Other liabilities	55,865
		Total liabilities	3,319,879

BOOK REVIEWS

Time Deposits in Present-Day Commercial Banking. By LAWRENCE L. CRUM. University of Florida Monographs. Social Sciences. No. 20, Fall 1963. Gainesville: University of Florida Press. pp. 69. $2.00.

In this slight monograph, Professor Crum has managed to cover a broad range of very interesting topics. Nothing that he says will strike close observers of the banking scene as particularly new; but, in brief compass, he has managed to survey the highlights of the very important trend toward greater importance of time deposits to commercial banks that has taken place with startling rapidity over the past several years.

He notes that time deposits have increased from less than a fourth of total commercial bank deposits in 1945 to a proportion in the neighborhood of 40 percent currently, and argues that it appears likely that time deposits will continue to increase in both relative as well as absolute importance. This being true, he argues that if commercial banks are not to be at a disadvantage in competing for time funds with nonbank financial institutions, it is important that present regulatory provisions which tend to impede time-deposit banking at commercial banks be removed.

Principal among the regulatory revisions necessary are the suspension of interest ceilings and the removal of reserve requirements on time deposits. Certain modifications of restrictions on earning-asset acquisition by commercial banks, especially in the areas of mortgage lending and other long-term lending, are also regarded as essential.

These recommendations are not new, of course. They were made in essentially the same form by the Commission on Money and Credit, among others. But Crum provides a useful summary of the arguments favoring such proposals; moreover, both his emphasis on the recent relative growth of time deposits in commercial banks, and his contention (which certainly seems reasonable to this reviewer) that this relative growth is likely to continue have the effect of lending added force to the earlier recommendations.

As one factor leading to the recent and rapid growth of time deposits, the introduction by the nation's largest banks of the negotiable time certificate (in early 1961) is particularly emphasized, and the banking system's subsequent experience with these instruments is surveyed. They have become a very important money market instrument within a very short span of time, of course, and, for this reason, Crum's discussion of banker motivations in issuing them, and of the motivations of various classes of demanders in acquiring them, is quite illuminating, and should be of interest even to those readers who have already surveyed Fieldhouse's earlier work in this area.[1]

A brief discussion of time deposit banking abroad, covering Great Britain, West Germany, France, Sweden, and Canada, compares and contrasts foreign experience with that of the United States. Striking differences are observable, and it is to be regretted that Professor Crum was not able to take the time and space to develop his discussion of these matters somewhat further.

Indeed, the principal criticism to which the monograph appears to be subject is that it is much too brief to be in any sense a definitive treatment. Crum hits the high spots of a complex and important subject in a very markedly condensed and summary fashion. Fortunately, he leaves a trail of footnotes behind him, which the interested reader may use to pursue given topics beyond the point where Crum leaves off.

CLIFTON H. KREPS, JR.

University of North Carolina

Monetary Management: A Survey of American Experience. By HAROLD BARGER. Chicago: Rand McNally & Company, 1964. pp. xiv + 422. $5.00.

In his Preface, Professor Barger warns: "If the scope and content [of this book] are thought capricious by some, no defense is offered except to say that the reader will

[1] Richard Fieldhouse, *Certificates of Deposit*, Boston: Bankers Publishing Company, 1962.

find discussed here the questions that seemed to me interesting and worth inquiry." This warning is justified, and the book is accordingly difficult to categorize. Some parts will interest policymakers and economists, and parts might be useful as supplementary reading for an advanced undergraduate course in money and banking.

This work deals with American experience with central banking from historical and analytical points of view. Part I, "Historical," provides a chronological account of monetary management from the First Bank of the United States through the early 1930's. I found particularly fascinating the history, in Chapter 2, of monetary management up to the first World War. The inappropriateness of the National Banking System, and a Treasury whose powers and responsibilities were severely circumscribed as vehicles for monetary management, are clearly demonstrated, and Barger's account of the events and ideas that led to the creation of the Federal Reserve System is very revealing. Moreover, the peculiar structure of the System, the original locus of power in New York, and the inadequacies of early policies are all treated with insight.

Barger's history of the shift in power from New York to Washington—a shift that involved the replacement of Strong and Harrison by Eccles and Martin as the leading figures in policy formation—is fascinating, but perhaps overdone. New York's influence is far from gone. Surely, for example, the abandonment of "bills only" in 1961 owed much to the New York Bank's having kept the idea of direct dealings in long-term government securities from being completely discredited by the System's own propaganda. And, just as surely, the System's recent concern with the international position of the dollar has been heightened by pressures from New York.

Barger's account of monetary management since the Treasury-Federal Reserve Accord of 1951 is largely a chronicle of the ups and downs of the economy. The author's casual attempts to relate economic performance to monetary policy are disappointing. His discussion of policy events since 1960 neglects completely the crucial role of changes in Regulation Q that have led to enormous increases in bank credit without depressing effects on short-term interest rates.

Part II, "Analysis", is, I feel, less rewarding than Part I. Barger asserts, but does not really defend, the important proposition that central banking exerts its influence over the economy through its effect on credit conditions—interest rates and credit availability—rather than through its effect on the money supply. His analysis is essentially Keynesian, but it does not embrace the "new" monetary economics as it has been developed by Tobin and others to make the Keynesian approach more meaningful by remedying its crippling oversimplification of the financial mechanism. Although Barger's intuitions may be sound, his analysis consists mainly of weakly supported assertions —just the sort of casual reasoning that has invited scathing attacks on "orthodox" central bank analysis by Meltzer and others.

Nor does Barger do justice to the quantity theorists, whose work he dismisses with alarming ease. Barger holds that Friedman's "rule"—constant growth of the money stock —will not work, but he shows no appreciation of the subtlety of Friedman's arguments. Nowhere is Friedman's assertion that the demand for money is determined primarily by the level of permanent income, or his evidence in support of this proposition, mentioned. A straightforward rebuttal of this argument cannot be avoided by the "anti-quantity" school if it is to arrest the growing support of Friedman. The failure of non-quantity theorists to produce much in the way of useful empirical generalizations is never mentioned by Barger, and the reader is given no hint of the tremendous turmoil that besets monetary analysis today.

Never reticent about expressing his own views, Barger takes the following stands, among others: (1) there is a conflict between full employment (defined as 97 percent of the labor force) and price stability; (2) full employment is worth the inflation that would probably be involved in attaining it; (3) adherence to the present gold-exchange standard is crippling, and should be abandoned; (4) the System should deal in all maturities of government securities, and should, in particular, focus attention on long-term rates; (5) the Federal Reserve is too independent of the Executive and the Con-

gress; (6) free reserves are a useful, though not complete, gauge of the status of monetary policy; (7) nonprice rationing of credit is a very important phenomenon; (8) consumption expenditures are not directly responsive to central banking policies, and consumer credit is the most logical candidate for selective controls; (9) institutional changes have not, and generally will not, render the central bank impotent; (10) the country is overconcerned with Federal budget deficits and a capital budget may be called for; (11) the dual banking system is outmoded; (12) fiscal policy offers a great, but as yet unrealized, potential for stabilization.

I am inclined to agree with at least half of the above propositions. But all are subjects of serious and earnest debate, and Barger has not advanced the debate. The reason is that he supports his views neither by intensive application of logic nor by carefully marshalling the relevant facts. Those whose views he dismisses, from Friedman to Gurley and Shaw, from Martin to Murphy, from Samuelson to Roosa, will probably feel unscathed.

SAMUEL B. CHASE, JR.

The Brookings Institution

Railroads and American Economic Growth: Essays in Economic History. By ROBERT W. FOGEL. Baltimore: Johns Hopkins Press, 1964. pp. x + 296. $6.95.

Robert Fogel has once again placed students of economic history in his debt with the publication of this fine collection of essays. Using the same careful empirical touch, and guided by the same clear analytical thinking that marked the earlier book, Fogel has illuminated new aspects of railway history and economic development. As in *Union Pacific*, Fogel is interested in evaluation, not description. This time his object is to measure the impact of the railway network on the U.S. economy. This is not the first attempt to evaluate this impact, but it may well be the best. Superlatives are rarely deserved, so let me justify this accolade by differentiating this book from works that have preceded it.

First of all, Fogel has made a careful and conscientious attempt to specify his criterion for evaluating railway investment. The measure he selects is the difference between actual GNP in 1890 and the GNP the U.S. would have had if railroad technology had been unavailable. This is not, of course, the only feasible measure. It neglects any socio-political impact of the railroad which might have stimulated (or retarded) economic development. It also excludes the kind of dynamic effects of the Rostow-Chenery-Rodan type that might have stimulated economic development by complex interactions between the railroad, its customers, and its suppliers.

Fogel deals with this latter issue by examining it in a separate essay. On the socio-political issue, he argues quite legitimately that we should first examine the economic impact of the railroad. Previous writers have used both economic and social arguments quite interchangeably in claiming dramatic effects for railway investment. By demonstrating that the net economic impact is quite small, Fogel shows that those who wish to ascribe great things to the railroad must fall back on socio-political arguments, about which he is obviously skeptical.

In choosing the criterion that he does, Fogel obviously sets himself an onerous task. To measure social gain, he must measure the cost of transportation in the absence of a railroad. This requires many assumptions about the state of a rail-less world and, after the assumptions are made, novel questions must be asked of the data. Just how adequately Fogel analyzes the facts is necessarily a matter of judgment for each reader. (Without agreeing with every step, I can state that I think his result is amply documented.) However, it is an impressive vindication of one of Fogel's main lines of argument that, once the right questions are asked, it is, in fact, possible to extract the necessary information. While we certainly know less than we would like to know, the main restriction on our further enlightenment is our *analytic* capability, rather than insufficient *data*. But while the answers to interesting questions are available, they are

strikingly absent from the existing literature—along with the interesting questions. Fogel's facility at extracting the requisite data should not delude the reader into thinking that the answers are easy to extract. Only one who has tried to mine these numbers before can appreciate Fogel's *empirical* contribution.

Fogel's first major finding is that the substitution of water and road transportation for the railroad in the carriage of agricultural products would almost certainly reduce GNP by less than 4 percent, and more likely by a mere 1.5 percent. Some historians will, no doubt, quarrel with those figures, but from now on, if they choose to quarrel, they must quarrel about amounts, not vague phrases. They may differ about the amount of inventories held by merchants using water transport rather than rail, or they may dispute the effect of two percent higher costs on farm land utilization, but questions about the role of the railroad will, forevermore, be empirical questions about which criteria must be stated, assumptions made explicit, and range of possible error discussed. That is Fogel's fundamental contribution, though his specific conclusions are equally important, and will hopefully lead to more fruitful discussions of economic development than have typified the literature.

One example of such re-examination of existing theories is Fogel's essay on Rostow's *The Stages of Economic Growth*. Rostow's well-known proposition places particular emphasis on the role of the railroad in the American "takeoff" into sustained growth which he dates as 1843-1860. Fogel finds, as others have before him, that Rostow's theory is too vaguely stated to be subjected to rigorous testing, but he does an extensive job of marshalling evidence to show that nothing happened in the "takeoff" period that was not a natural extension of what had started before and continued later at much the same rate. In particular, the much-touted "secondary" impact of the railroad on associated industries turns out to be secondary indeed. While a workmanlike job, this is not the strongest of the essays, since Rostow proves to be an evasive target and Fogel, in his eagerness, over-stresses the continuity of manufacturing development. It would be a shame, I think, if Rostow's rather unscientific theory of economic development should lead economic historians to neglect his pathbreaking contributions to the analysis of economic fluctuations.

In my own opinion, Chapter V is the most impressive, perhaps because I am most familiar with the raw material with which Fogel worked, and thus can best appreciate the magnificence of the edifice he has erected. It is in reconstructing U.S. pig iron production, 1840-60, and delineating the role of railway demand, that Fogel's analytic abilities and empirical talents show to best advantage. Historians will be indebted to him for a long time for resolving the controversy about pre-Civil War iron production, and establishing how small a role the railroad played in it.

In a well-written summary, Fogel develops his general view of the railroad and the process of economic growth—"a view (that) makes growth the consequence not of one or a few lucky discoveries but of a broad supply of opportunity created by the body of knowledge accumulated over all preceding centuries." Then, in a few further pages he presents his philosophy of economic historical research, and makes the case for the new economic history as cogently and with greater brevity than I have seen it done before. My only regret is that this summary followed rather than preceded the other essays.

My only comment on this methodological essay is that it is unfortunate that the "new economic history" has come to be identified as "quantitative" or "mathematical." Those adjectives do apply, but they do not, I think, reflect the essential contribution. The real novelty is the application of abstract analytical economic reasoning to history—the end of the artificial distinction between the principles taught in the economic theory course and the data-gathering or idle speculation that used to be called economic history. It is only secondary that sound abstractions produce verifiable hypotheses, permit quantitative testing, and make mathematical manipulations useful. Fogel uses mathematics, but it is elementary mathematics: his contribution lies not in his mathematics but in his analysis. Even if he had not *measured* the net contribution of the railroads to GNP, he would have made an

immense contribution by posing the problem the way he did.

While Fogel recognizes the importance of theory in his methodology as well as in practice, it needs more stress. For I fear that future economic historians, like some modern economic theorists, may find virtue in the mathematics rather than the analysis. The early mathematical *economist* did not make that mistake either.

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Money and Banking: Analysis and Policy. By CHARLES R. WHITTLESLEY, ARTHUR M. FREEDMAN, and EDWARD S. HERMAN. New York: The Macmillan Company, 1963. pp. xxii + 617. $8.50

This new work combines a lucid exposition of the workings of the monetary system, past and present, with a modicum of material pertinent to recent discussions in monetary thought and policy. It claims to be a completely re-written version of Charles Whittlesley's *Principles and Practice of Money and Banking,* but, in fact, it quite closely resembles the previous work.

Whittlesley and his fellow authors believe that "monetary and fiscal analysis are best understood after an explanation of money and credit, money markets, the mechanism of commercial banking, central banking and related elements of the framework of finance." The chapters are, therefore, arranged in order to carry the reader through this sequence in preparation for the theoretical treatment of money and income. With this analytical framework in his grasp, the reader is then led to a consideration of financial policy and, in conclusion, a section on international finance.

By trying to be "all things to all men" who instruct "Money and Banking" courses, this book, like many of its competitors, has a tendency to be encyclopaedic. "Giantism" is an old infection of economics textbooks, which in the last few years has reached the epidemic stage. Surely it is time for textbook writers (publishers?) to admit that it is a bit thick to expect even the most assiduous of students to absorb twenty-five to thirty chapters in one semester.

One cannot quarrel with the manner in which the authors introduce the great amount of technical information. Chapters on rather tedious topics, such as "Monetary Types and Standards," are made as painless as possible because the presentations are uniformly well written. One can argue, however, that some other subjects receive scant attention, or are disregarded entirely. It is a pleasure to find, for instance, a concise appendix on "Price and Yield Relationships" which would, no doubt, prove invaluable to the student when later considering money and asset analysis. But it is odd that a similar appendix on "Price Indexes" does not appear anywhere in the book. Similarly, a simple model of demand deposit expansion and limitation, when constrained by an external drain, is presented and may be easily extended to include effects of shifts from demand to time deposits, or changes in banks' desires for excess reserves. While the principal types of non-bank financial intermediaries are noted and their functions discussed, no mention is made of the primary avenues by which growth of liabilities at these institutions may affect the efficacy of monetary policy; and intermediary activity as a cyclical de-stabilizer is given only cursory attention. Growing public interest and discussion demand a more comprehensive treatment of these questions.

Tools and activities of the Federal Reserve system are examined in detail, but the exposition reflects little of the controversy that has centered on the usefulness of the discount window, or the "bills only" doctrine, during this last decade. This is all the more surprising in the light of Professor Whittlesey's prominence in some of these debates.

Quantity theories of money and prices are well represented, and serve as an adequate preamble to the introduction of a series of Keynesian income-determination models. Market by market, the authors build up an integrated model of money, interest, and income. In the process, they deal with the multiplier-accelerator mechanism at length, but spend only five pages dealing with the stock-flow relationship between existing capital levels and the rate of investment. The integrated four quadrant model suffers

from a rather clumsy dichotomy of money demand into interest and income elastic quadrants, and completely ignores determination of the price level. Inflation is discussed in the next chapter, where the price level is determined by aggregate demand and supply. Some readers are likely to question this arrangement, just as they may question the omission of Buchanan's works from the selected bibliography on the national debt.

Little need be said about the review of monetary and fiscal policy that follows the analytical chapters. It describes quite adequately the major economic events of the period 1914-1962, and gives the reader a good sense of historical perspective. The book concludes with an introduction to international finance.

The problem of resource allocation among various topics by both authors and reader depends inevitably upon value judgements. As a result, any consideration of the content and spatial arrangement of a book becomes a subjective matter. In my opinion, the only serious deficiencies of this text are in the theoretical department, and in its inadequate discussion of recent trends in theory and policy. These are common failings of undergraduate "Money and Banking" texts, and the present work is by no means the worst offender in this respect. It is redeemed by its treatment of monetary institutions and mechanisms, thus meriting the serious consideration of instructors primarily concerned with these areas.

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